MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
Sponsored by CMR Educational Society
(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)
Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.
Contact Number: 040-23792146/64634237, E-Mail ID: mrcet2004@gmail.com, website: www.mrcet.ac.in

BACHELOR OF TECHNOLOGY
ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC REGULATIONS
(Batches admitted from the academic year 2018 - 2019)

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- ➢ "Autonomous Institution /College" means an institution/college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.

- ➢ "Academic Autonomy" means freedom to the College in all aspects of conducting its academic programs, granted by the University for promoting excellence.

- ➢ "Commission" means University Grants Commission.

- ➢ "AICTE" means All India Council for Technical Education.

- ➢ "University" the Jawaharlal Nehru Technological University, Hyderabad.

- ➢ "College" means Malla Reddy College of Engineering & Technology, Secunderabad unless indicated otherwise by the context.

- ➢ "Program" means:
    - ▪ Bachelor of Technology (B.Tech) degree program
    - ▪ UG Degree Program: B.Tech

- ➢ "Branch" means specialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineering etc.

- ➢ "Course" or "Subject" means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester.

- ➢ T–Tutorial, P–Practical, D–Drawing, L-Theory, C-Credits

FOREWORD

The autonomy is conferred on Malla Reddy College of Engineering & Technology (MRCET) by UGC based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Malla Reddy College of Engineering & Technology (MRCET) is proud to win the credence of all the above bodies monitoring the quality of education and has gladly accepted the responsibility of sustaining, and also improving upon the values and beliefs for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several experts drawn from academics, industry and research, in accordance with the vision and mission of the college which reflects the mindset of the institution in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought at appropriate time with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The cooperation of all the stakeholders is sought for the successful implementation of the autonomous system in the larger interests of the institution and brighter prospects of engineering graduates.

"A thought beyond the horizons of success committed for educational excellence"

PRINCIPAL

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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VISION

❖ To establish a pedestal for the integral innovation, team spirit, originality and competence in the students, expose them to face the global challenges and become technology leaders of Indian vision of modern society.

MISSION

❖ To become a model institution in the fields of Engineering, Technology and Management.

❖ To impart holistic education to the students to render them as industry ready engineers.

❖ To ensure synchronization of MRCET ideologies with challenging demands of International Pioneering Organizations.

QUALITY POLICY

❖ To implement best practices in Teaching and Learning process for both UG and PG courses meticulously.

❖ To provide state of art infrastructure and expertise to impart quality education.

❖ To groom the students to become intellectually creative and professionally competitive.

❖ To channelize the activities and tune them in heights of commitment and sincerity, the requisites to claim the never - ending ladder of **SUCCESS** year after year.

For more information: www.mrcet.ac.in

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
COURSE STRUCTURE

I Year B. Tech – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0001	English	2	-	-	2	30	70
2	R18A0021	Mathematics – I	3	1	-	4	30	70
3	R18A0013	Applied Physics	3	-	-	3	30	70
4	R18A0301	Engineering Graphics	1	-	4	3	30	70
5	R18A0501	Programming for Problem Solving	3	-	-	3	30	70
6	R18A0082	Engineering/IT Workshop	-	-	4	2	30	70
7	R18A0581	Programming for Problem Solving Lab	-	-	3	1.5	30	70
8	R18A0081	English Language Communication Skills Lab	-	-	3	1.5	30	70
		TOTAL	**12**	**1**	**14**	**20**	**240**	**560**

I Year B. Tech – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0002	Professional English	2	-	-	2	30	70
2	R18A0022	Mathematics – II	3	1	-	4	30	70
3	R18A0012	Engineering Chemistry	3	-	-	3	30	70
4	R18A0502	Object Oriented Programming	3	-	-	3	30	70
5	R18A0201	Basic Electrical Engineering	3	-	-	3	30	70
6	R18A0083	Engineering Physics/Chemistry Lab	-	-	4	2	30	70
7	R18A0582	Object Oriented Programming Lab	-	-	3	1.5	30	70
8	R18A0281	Basic Electrical Engineering Lab	-	-	3	1.5	30	70
9*	R18A0003	Human Values & Societal Perspectives	2	-	-	0	100	-
		TOTAL	**16**	**1**	**10**	**20**	**340**	**560**

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

II Year B. Tech – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0023	Mathematics – III	3	-	-	3	30	70
2	R18A0401	Electronic Devices And Circuits	3	-	-	3	30	70
3	R18A0202	Electrical Circuit Analysis	3	-	-	3	30	70
4	R18A0203	Electrical Machines-I	3	-	-	3	30	70
5	R18A0462	Digital Electronics	3	-	-	3	30	70
6	R18A0366	Basic Mechanical Engineering	3	-	-	3	30	70
7	R18A0481	Electronic Devices And Circuits Lab	-	-	3	1.5	30	70
8	R18A0393	Basic Mechanical Engineering Lab	-	-	3	1.5	30	70
9	R18A0004	Foreign Language: French	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

II Year B. Tech – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0204	Electrical Machines -II	3	-	-	3	30	70
2	R18A0205	Power Systems-I	3	-	-	3	30	70
3	R18A0206	Electromagnetic Fields	3	-	-	3	30	70
4	R18A0406	Analog Circuits	3	-	-	3	30	70
5	R18A0061	Managerial Economics & Financial Analysis	3	-	-	3	30	70
6	OE1	OPEN ELECTIVE 1	3	-	-	3	30	70
7	R18A0282	Electrical Machines -I Lab	-	-	3	1.5	30	70
8	R18A0283	Networks & Simulation Lab	-	-	3	1.5	30	70
9*	R18A00014	Environmental Science	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

OPEN ELECTIVE 1		
S.NO	SUBJECT CODE	SUBJECT
1	R18A0451	Digital Electronics
2	R18A0251	Elements of Electrical Engineering
3	R18A0551	Database Systems
4	R18A0351	Elements of Mechanical Engineering
5	R18A0352	Green Energy Systems
6	R18A0051	Intellectual Property Rights

III Year B. Tech – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0207	Power Systems -II	3	-	-	3	30	70
2	R18A0208	Electrical Machines -III	3	-	-	3	30	70
3	R18A0209	Power Electronics	3	-	-	3	30	70
4	R18A0210	Control Systems	3	-	-	3	30	70
5	R18A0211 R18A0212 R18A0213	1.Wind & Solar Energy Systems 2. power system analysis 3.power system reliability engineering	3	-	-	3	30	70
6	OE2	OPEN ELECTIVE 2	3	-	-	3	30	70
7	R18A0284	EM-II Lab	-	-	3	1.5	30	70
8	R18A0285	Power Electronics Lab	-	-	3	1.5	30	70
9*	R18A0006	Technical Communication & Soft Skills	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

OPEN ELECTIVE 2		
S.NO	SUBJECT CODE	SUBJECT
1	R18A0452	Industrial Electronics
2	R18A0453	Communication Networks
3	R18A0552	Introduction to Data Structures
4	R18A1251	Software Project Management
5	R18A1252	Introduction to Analytics
6	R18A0353	Operations Research

III Year B. Tech – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0214	Measurements & Instrumentation	3	-	-	3	30	70
2	R18A0415	Microprocessors & Microcontrollers	3	-	-	3	30	70
3	R18A0402	Signals & Systems	3	-	-	3	30	70
4	R18A0215 R18A0216 R18A0217	1. Electrical Drives 2. Artificial Neural Networks 3. Power System Operation & Control	3	-	-	3	30	70
5	OE3	OPEN ELECTIVE 3	3	-	-	3	30	70
6	R18A0286	Control Systems Lab	-	-	3	1.5	30	70
7	R18A0287	Power Systems Lab	-	-	3	1.5	30	70
8	R18A0290	Miniproject	-	-	6	3	30	70
9*	R18A0007	Constitution of India	2	-	-	0	100	-
		TOTAL	17	0	12	21	340	560

OPEN ELECTIVE 3		
S.NO	SUBJECT CODE	SUBJECT
1	R18A0454	Robotics Engineering
2	R18A0455	Bio Medical Engineering
3	R18A0553	Python Programming
4	R18A0554	Game Programming
5	R18A0354	Nano Technology
6	R18A0052	Enterprise Resource Planning

IV Year B. Tech – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0218	Electrical Engineering materials	3	-	-	3	30	70
2	R18A0514	Computer Networks	3	-	-	3	30	70
3	R18A0219	Utilization of Electrical Energy	3	-	-	3	30	70
4	R18A0220	Switch Gear and Protection	3	-	-	3	30	70
5	R18A0221 R18A0222 R18A0223	1. Advanced Control Systems 2. Electrical & Hybrid Vehicles 3. High Energy Storage Systems	3	-	-	3	30	70
6	R18A0488	MPMC Lab	-	-	3	1.5	30	70
7	R18A0288	Measurements Lab	-	-	3	1.5	30	70
8	R18A0291	Project-I	-	-	6	3	30	70
		TOTAL	15	0	12	21	240	560

IV Year B. Tech – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0224	HVDC Transmission Systems	3	-	-	3	30	70
2	R18A0225 R18A0226 R18A0227	1. Power Quality 2. EHV AC Transmission Systems 3. FACTS Devices	3	-	-	3	30	70
3	R18A0228 R18A1261 R18A0229	1. PLC & Embedded Systems 2. Network security & Cryptography 3. Electrical Estimation & Costing	3	-	-	3	30	70
4	R18A0292	Project -II	-	-	12	6	60	140
		TOTAL	9	0	12	15	150	350

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I- SEM -EEE   **L   T/P/D   C**

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(R18A0001) ENGLISH

OBJECTIVES:

1. To enable students to enhance their lexical, grammatical and communicative competence.
2. To equip the students to study the academic subjects with better perspective through theoretical and practical components of the designed syllabus.
3. To familiarize students with the principles of writing to ensure error-free writing.
4. To know to use sentence structure effectively and to understand how to convert ideas logically within a sentence.
5. To expose students to various techniques of reading skills which hone their comprehensive skills.

UNIT –I

Chapter entitled "***The Road Not Taken" by*** Robert Frost

Grammar   –Tenses and Punctuation (Sequences of Tenses)

Vocabulary   –Word Formation - Prefixes and Suffixes

Writing   – Paragraph writing –I (Focusing on Tenses and Punctuations)

Reading   – Techniques for effective reading-Reading Exercise –Type 1

UNIT – II

Chapter entitled "***Abraham Lincoln's Letter to His Son's Teacher***"

Grammar   – Voices, Transitive and Intransitive Verbs

Vocabulary   – Synonyms, Antonyms

Writing   – E-mail Writing, Letter Writing (complaints, requisitions, apologies).

Reading   – Skimming, scanning- Reading Exercise –Type 2

UNIT – III

Chapter entitled "***War***" by L. Pirandello

Grammar   –Degrees of Comparison, Prepositions

Vocabulary – Phrasal Verbs

Writing   – Essay Writing (Introduction, body and conclusion)

Reading   – Comprehension- Reading Exercise – Type 3

UNIT – IV

Chapter entitled "***J K Rowling's Harvard Speech***"

Grammar   – Articles, Misplaced Modifiers

Vocabulary – One-Word Substitutes

Writing   – Précis Writing

Reading   – Intensive and Extensive reading - Reading Exercise – Type 4

UNIT –V

Sentence Structures (phrases and clauses)

Grammar   – Subject-Verb Agreement, Noun-Pronoun Agreement
Vocabulary – Commonly Confused Words
Writing   – Memo Writing
Reading   – Identifying Errors - Reading Exercise – Type 5

* Exercises apart from the text book shall also be used for classroom tasks.

TEXT BOOKS:
1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book. 2001

REFERENCE BOOKS:
1. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

OUTCOMES:
Students will be able to:
1. Write formal or informal letters and applications for different purposes.
2. Select and extract relevant information through skimming and scanning.
3. Utilize the strategy of brainstorming in preparing analytical, argumentative and expository essays.
4. Draft concise emails following professional email etiquette.
5. Enhance their grammatical competency by spotting errors.

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B. TECH- I- YEAR- I- SEM –EEE   L T/P/D C
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(R18A0021) MATHEMATICS -I

OBJECTIVES:

To learn

1. The concept of rank of a matrix which is used to know the consistency of system of linear equations and also to find the eigen vectors of a given matrix.
2. Finding maxima and minima of functions of several variables.
3. Applications of first order ordinary differential equations. (Newton's law of cooling, Natural growth and decay)
4. How to solve first order linear, non linear partial differential equations and also method of separation of variables technique to solve typical second order partial differential equations.
5. Solving differential equations using Laplace Transforms.

UNIT I:

Matrices

Introduction, types of matrices-symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal, unitary matrices. Rank of a matrix - echelon form, normal form, consistency of system of linear equations (Homogeneous and Non-Homogeneous). Eigen values and Eigen vectors and their properties (without proof), Cayley-Hamilton theorem (without proof), Diagonalisation.

UNIT II:

Functions of Several Variables

Limit continuity, partial derivatives and total derivative. Jacobian-Functional dependence and independence. Maxima and minima and saddle points, method of Lagrange multipliers, Taylor's theorem for two variables.

UNIT III:

Ordinary Differential Equations

First order ordinary differential equations: Exact, equations reducible to exact form. Applications of first order differential equations - Newton's law of cooling, law of natural growth and decay.

Linear differential equations of second and higher order with constant coefficients: Non-homogeneous term of the type $f(x) = e^{ax}$, sinax, cosax, x^n, e^{ax} V and x^n V. Method of variation of parameters.

UNIT IV:

Partial Differential Equations

Introduction, formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear equation and non-linear equations, Charpit's method, Method of separation of variables for second order equations and applications of PDE to one dimensional (Heat equation).

UNIT V:

Laplace Transforms

Definition of Laplace transform, domain of the function and Kernel for the Laplace transforms, Existence of Laplace transform, Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied or divided by "t", Laplace transforms of derivatives and integrals of functions, Unit step function, Periodic function.

Inverse Laplace transform by Partial fractions, Inverse Laplace transforms of functions when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem, Solving ordinary differential equations by Laplace transforms.

TEXT BOOKS:

1. Higher Engineering Mathematics by B V Ramana ., Tata McGraw Hill.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.

REFERENCE BOOKS:

1. Advanced Engineering Mathematics by R.K Jain & S R K Iyenger, Narosa Publishers.
2. Advanced Engineering Mathematics by Michael Green Berg, Pearson Publishers .
3. Engineering Mathematics by N.P Bali and Manish Goyal.

OUTCOMES:

After learning the concepts of this paper the student will be able to

1. Analyze the solution of the system of linear equations and to find the Eigen values and Eigen vectors of a matrix.
2. Find the extreme values of functions of two variables with / without constraints.
3. Solve first and higher order differential equations.
4. Solve first order linear and non-linear partial differential equations.
5. Solve differential equations with initial conditions using Laplace Transform.

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B.TECH – I YEAR – I SEM - EEE   **L   T/P/D   C**
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(R18A0011) APPLIED PHYSICS

OBJECTIVES:
1. To understand dual nature of the matter and behavior of a particle quantum mechanically.
2. To understand band structure of the solids and classification of materials.
3. To be able to distinguish pure, impure semiconductors and characteristics of PN junction diode.
4. To understand dielectric and magnetic properties of the materials and enable them to design and apply in different fields.
5. To be able to distinguish ordinary light with a laser light and realize the transfer of light through optical fibers.

UNIT – I
QUANTUM MECHANICS
Wave nature of particles, deBroglie's hypothesis, matter waves, Heisenberg's uncertainty principle, Davisson and Germer's experiment, G.P Thomson experiment, Schrodinger time-independent wave equation-significance of wave function, particle in one dimensional square well potential.

UNIT – II
ELECTRONIC MATERIALS
Free electron theory, Fermi level, Density of states, Periodic potential-Bloch's theorem, Kronig – Penny modal, E – K diagram, Effective mass, Origin of energy bands in solids, Classification of materials on the basis of energy bands: Metals, semi conductors and insulators.

UNIT – III
SEMICONDUCTOR PHYSICS
Intrinsic and extrinsic semiconductors, Direct and indirect band gap semi conductors, Carrier concentration in intrinsic and extrinsic semi conductors. Dependence of Fermi level on carrier concentration and temperature, carrier transport: diffusion and drift, Formation of PN junction, V-I characteristics of PN diode, energy diagram of PN diode, Hall experiment, semiconductor materials for optoelectronic devices - LED, Solar cell.

UNIT-IV
DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS
Dielectrics: Introduction, Types of polarizations (Electronic and Ionic) and calculation of their polarizabilities, internal fields in a solid, Clausius-Mossotti relation.
Magnetism: Introduction, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Properties of anti-ferro and ferri magnetic materials, Hysteresis curve based on domain theory, Soft and hard magnetic materials.

UNIT – V:

LASERS & FIBER OPTICS

Characteristics of lasers, Absorption, Spontaneous and Stimulated emissions, Einstein's Coefficients, Population inversion, Meta stable state, types of pumping, lasing action, Construction and working of Ruby Laser, Helium-Neon Laser, Applications of lasers.

Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and Numerical aperture, Types of Optical fibers - Mode and Propagation through step and graded index fibers, Attenuation, Optical Fiber in Communication System, Applications of optical fibers.

TEXT BOOKS:

1. Engineering Physics by Arumugam, Anuradha publications.
2. Engineering Physics- B.K.Pandey, S.Chaturvedi, Cengage Learning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L.Gupta, Dhanpat Rai Publishers.
2. Engineering Physics, S Mani Naidu- Pearson Publishers.
3. Engineering physics 2nd edition –H.K.Malik and A.K. Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitech publications.
5. Physics by Resnick and Haliday.

OUTCOMES:

After completion of studying Applied Physics the student is able to,

1. Know the basic principles of quantum mechanics and the importance of behavior of a particle.
2. Realize the importance of band structure of solids and their applications in various electronic devices.
3. Learn concentration estimation of charge carriers in semiconductors and working principles of PN diode.
4. Learn dielectric, magnetic properties of the materials and apply them in material technology.
5. Learn the principles and production of LASER beams and transfer of information by optical fiber communication systems.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH – I- YEAR –I SEM- EEE   L   T/P/D   C
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(R18A0301) ENGINEERING GRAPHICS

Course Objectives:

1. Learn to sketch and take field dimensions.
2. Learn to take data and transform it into graphic drawings.
3. Learn basic engineering drawing formats

UNIT – I

Introduction To Engineering Drawing: Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing- Dimensioning – Lettering practice – BIS Conventions.

a) Polygons – Construction of regular polygons (General Method only)
b) Conic Sections (General Method only- Eccentricity Method)
c) Cycloid, Epicycloid and Hypocycloid
d) Scales-Plain, Diagonal and Vernier

UNIT – II

Orthographic Projection in First Angle only: Principles of Orthographic Projections – Conventions – First and Third Angle projections (Introduction).

Projections of Points. Points in all four quadrants.

Projections of Lines – Parallel and inclined to both planes.

UNIT – III

Projections of Planes: Projection of regular planes, Plane inclined to both reference planes (No conditional problems).

Projections of Solids: Projections of regular solids prism and pyramid inclined to both planes (No conditional problems).

UNIT – IV
Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Plane Figures, Simple and Compound Solids.

UNIT – V

Transformation of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects

Basic Principles of ACAD – Demo Only.

Course Outcomes:

1. Student's ability to convert sketches to engineered drawings will increase.
2. Students will be able to draw orthographic projections and sections.
3. Student's ability to perform basic sketching techniques will improve.

TEXT BOOKS

1. Engineering Drawing, Special Edition-MRCET, McGrahill Publishers, 2017.
 2. Engineering Drawing, N.D. Bhatt
3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.

REFERENCES

1. Engineering drawing – P.J. Shah .S.Chand Publishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.

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B. TECH – I- YEAR –I SEM- EEE	L	T/P/D	C
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(R18A0501) PROGRAMMING FOR PROBLEM SOLVING

OBJECTIVES
1. To understand the various steps in Program development.
2. To understand the basic concepts in C Programming Language.
3. To learn how to write modular and readable C Programs
4. To learn to write programs (using structured programming approach) in C to solve problems.

UNIT - I
Introduction to Computing – Computer Systems-Hardware and Software, Computer Languages, Algorithm, Flowchart, Representation of Algorithm and Flowchart with examples.
Introduction to C– History of C, Features of C, Structure of C Program, Character Set, C Tokens-Keywords, Identifiers, Constants, Variables, Data types, Operators.

UNIT-II
Statements-Selection statements (Decision Making)- if and switch statements with examples, Repetition statements (loops)- while, for, do-while statements with examples, Unconditional statements- break, continue, goto statements with examples.

UNIT – III
Functions-Designing Structured Programs, Types of Functions-User defined functions, Standard functions, Categories of functions, Parameter Passing techniques, Storage classes, Recursion.

UNIT-IV
Arrays- Declaration and Initialization, One dimensional Arrays, Two dimensional Arrays.
Strings- Declaration and Initialization, String Input / Output functions, String manipulation functions.

UNIT-V
Pointers- Introduction, Definition and Declaration of pointers, address operator, Pointer variables, Pointers with Arrays.
Structures- Introduction, Declaration and Initialization, Array of Structures, Unions.

TEXT BOOKS:
1. Computer Programming with C, Special Edition-MRCET, Mc Graw Hill Publishers 2017.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg. Third Edition, Cengage Learning.

REFERENCE BOOKS:
1. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
2. Computer Programming, E.Balagurusamy, First Edition, TMH.
3. C and Data structures – P. Padmanabham, Third Edition, B.S. Publications.
4. Programming in *C, Ashok Kamthane*. Pearson Education India.
5. Let us C ,Yashwanth Kanethkar, 13th Edition, BPB Publications.

OUTCOMES:
1. Demonstrate the basic knowledge of computer hardware and software.
2. To formulate simple algorithms for arithmetic and logical problems.
3. To translate the algorithms to programs (in C language).
4. To test and execute the programs and correct syntax and logical errors.
5. Ability to apply solving and logical skills to programming in C language and also in other languages.

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(R18A0082) ENGINEERING WORKSHOP/ IT WORKSHOP

OBJECTIVES:
1. Student able to learn about different tools used in the lab
2. Student able to learn about foundry, welding, plumbing, house wiring and Tin smithy operations
3. Student able to learn about different Carpentry and Fitting tools

1. TRADES FOR EXERCISES:
At least two exercises from each trade:
1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring

2. TRADES FOR DEMONSTRATION & EXPOSURE:
1. Plumbing
2. Machine Shop
3. Welding
4. Foundry
5. Metal Cutting (Water Plasma)

TEXT BOOK:
1. Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.
   Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition

OUTCOMES:
1. Students can understand different machine shop operations
2. Students can understand Foundry, welding, plumbing, house wiring and Tin smithy operations
3. Student learned about metal cutting processes

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(R18A0082) IT WORKSHOP LAB

OBJECTIVES:
1. The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, and Power Point
2. PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows; In addition hardware and software level troubleshooting process, tips and tricks would be covered.
3. Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.
4. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools.
5. HTML introduction for creating static web pages

PC HARDWARE
Week 1:
Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral
Week 2:
Assembling and disassembling of PC
Week 3:
Every student should individually install MS windows on the personal computer. Basic DOS Commands
Week 4: Hardware Troubleshooting
Students have to be given a PC which does not boot due to improper assembly or defective peripherals Software Troubleshooting: Students have to be given amalfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.
Week 5: INTERNET & WEB BROWSERS
Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers And How to access the websites and email& Search Engines & various threats on the internet and would be asked to configure their computer to be safe on the internet, Antivirus downloads to avoid viruses and/or worms.

MS OFFICE

Week 6: MICROSOFT WORD

Word Orientation: an overview of Microsoft (MS) office 2007/ 10: Importance of MS office 2007/10, overview of toolbars, saving files, Using help and resources, rulers, format painter. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Using Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in Word &Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Week 7: MICROSOFT EXCEL

Excel Orientation: The importance of MS office 2007/10 tool Excel as a Spreadsheet tool, Accessing, overview of toolbars, saving excel files, Using help and resources.

Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting .

Week 8: MICROSOFT POWER POINT

Basic power point utilities and tools which helpful to create basic power point presentation. Topic covered during this includes PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both Latex and Power point.

Create the presentation using the following tools:

Formatting: Color, font type, font size, font style etc.

Header and Footer

Bullets and Numbering

Drawing Toolbar: Auto shapes, Textboxes, etc

Design Template

Introduction to custom animation.

b) Create a presentation to conduct a creativity session using the following tools:

1. Slide transition
2. Master slide view
3. Insert picture – clipart, image
4. Action button
5. Drawing tool bar – lines, arrows
6. Hyperlink
7. Custom animation
8. Hide slide
9. Wash out

Week 9: **HTML**

Introduction to HTML & Basic HTML Tags: Understand what are the tasks used for creation of website

 Designing a static web page: Understand how to create a webpage

TEXT BOOKS:
1. Introduction to Information Technology,ITL Education Solutions limited,Pearson Education
2. PC Hardware and A+ Handbook-Kate J.Chase PHI(Microsoft)

OUTCOMES:
1. The Students are able to identify the major components of a computer and its basic peripherals. They are capable of assembling a personal computer, and can perform installation of system software like MS Windows and required device drivers.
2. Students can detect and perform minor hardware and software level troubleshooting.
3. The Students are capable of working on Internet & World Wide Web and can make effective usage of the internet for academics.
4. The Students develop ability to prepare professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools.
5. The students are able to create a static webpage's using HTML.

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(R18A0581) PROGRAMMING FOR PROBLEM SOLVING LAB

OBJECTIVES:

1. Understand the basic concept of C Programming, and its different modules that include conditional and looping expressions, Arrays, Strings, Functions, Pointers, and Structures.
2. Acquire knowledge about the basic concept of writing a program.
3. Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
4. Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
5. Role of Functions involving the idea of modularity.
6. Programming using gcc compiler in Linux.

Week 1:
a) Write a C program to find sum and average of three numbers.
b) Write a C program to find the sum of individual digits of a given positive integer.

Week 2:
a) Write a C program to generate the first n terms of the Fibonacci sequence.
b) Write a C program to generate prime numbers from 1 to n.
c) Write a C program to check whether given number is Armstrong Number or not.

Week 3:
a) Write a C program to check whether given number is perfect number or not.
b) Write a C program to check whether given number is strong number or not.

Week 4:
a) Write a C program to find the roots of a quadratic equation.
b) Write a C program to perform arithmetic operations using switch statement.

Week 5:
a) Write a C program to find factorial of a given integer using non-recursive function.
b) Write a C program to find factorial of a given integer using recursive function.

Week 6:
a) Write C program to find GCD of two integers by using recursive function.
b) Write C program to find GCD of two integers using non-recursive function.

Week 7:
a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C program to Sort the Array in an Ascending Order
c) Write a C program to find whether given matrix is symmetric or not.

Week 8:
Revision of programs

Week 9:
a) Write a C program to perform addition of two matrices.
b) Write a C program that uses functions to perform multiplication of two Matrices.

Week 10:

a) Write a C program to use function to insert a sub-string in to given main string from a given position.

b) Write a C program that uses functions to delete n Characters from a given position in a given string.

Week 11:

a) Write a C program using user defined functions to determine whether the given string is palindrome or not.

b) Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.

Week 12:

a) Write C program to count the number of lines, words and characters in a given text.

b) Write a C program to find the sum of integer array elements using pointers.

Week 13:

a) Write a C program to Calculate Total and Percentage marks of a student using structure.

Week 14:

Revision of Programs

TEXT BOOKS

1. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications
2. Computer programming in C.V.RAjaraman, PHI Publishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMH Publishers.
4. C Programming, M.V.S.S.N Venkateswarlu and E.V.Prasad,S.Chand Publishers
5. Mastering C,K.R.Venugopal and S.R.Prasad, TMH Publishers.

OUTCOMES:

1. Acquire knowledge about the basic concept of writing a program.
2. Understand the Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
3. Learn how to use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
4. Understand the Role of Functions involving the idea of modularity.
5. Understand the Concept of Array and pointers dealing with memory management.
6. Learn Structures and unions through which derived data types can be formed.

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(R18A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

OBJECTIVES:

1. To expose students to a variety of self-instructional, learner-friendly modes of language learning

2. To enable students to learn accurate pronunciation through stress on word accent, intonation and rhythm.

3. To enable students to overcome public speaking anxiety and equip them to become employable.

4. To familiarize students with formal telephonic expressions by means of appropriate tone.

5. To foster sentence-level and holistic understanding of the context through active listening.

Syllabus: English Language Communication Skills Lab has two parts:

                    a. Computer Assisted Language Learning (CALL) Lab
                    b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab.

UNIT –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants-Transcriptions

ICS Lab: Ice-Breaking Activity - JAM Session- Greetings – Taking Leave – Introducing Oneself and Others.

UNIT –II

CALL Lab: Syllabification - Stress &Intonation- Rules of Stress Markings and Intonation

ICS Lab: Situational Dialogues/Role Plays - Making Requests and Seeking Permissions.

UNIT –III

CALL Lab: Listening Activities (Its Importance – Purpose- Process- Listening for General and Specific Details.)

ICS Lab: Communication at Work Place - Professional Etiquettes, Telephone Etiquette.

ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P –IV Processor

        a)Speed –2.8 GHZ

        b)RAM –512 MB Minimum

        c)HardDisk –80 GB

ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

A spacious room with movable chairs and audio-visual aids with a public address system, a T. V, a digital stereo –audio & video system and camcorder etc.

OUTCOMES:

Students will be able to:

1. understand the importance of learning phonetics.
2. learn how to pronounce words using phonetic transcription.
3. know the importance of speaking English with rhythm and intonation.
4. effectively participate in JAM session.
5. use polite expressions in all formal situations.
6. effectively communicate through telephone.

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(R18A0002) PROFESSIONAL ENGLISH

OBJECTIVES:
1. To enrich students to express themselves appropriately and fluently in professional contexts.
2. To enhance their employability through regular participation in group discussions and interview skills.
3. To lay foundation with writing strategies for the future workplace needs.
4. To acquaint students with different components of professional presentation skills.
5. To equip students with necessary training in listening to comprehend dialects of English language.

UNIT-I

Listening   - Bill Gate's TED talk on Solving Big Problems

Speaking   - Description of Pictures, Places, Objects and Persons

Grammar   - Finite and Non-finite verbs

Vocabulary   - Business Vocabulary

Writing   - Paragraph Writing

Unit –II

Listening   - Google CEO Sundar Pichai's Speech I/O 2017 Keynote

Speaking   - Oral presentations

Grammar   - Transformation of Sentences

Vocabulary   - Idioms

Writing   - Abstract Writing

Unit –III

Listening   - Sample Interviews (videos)

Speaking   - Mock Interviews

Grammar   - Direct and Indirect Speech

Vocabulary   - Standard Abbreviations (Mini Project)

Writing   - Job applications I (Cover Letter)

Unit – IV

Listening   - Telephonic Interviews

Speaking   - Telephonic Expressions

Grammar   - Auxiliary verbs

Vocabulary   - Word Analogy-I

Writing   - Job Application II (Resume)

Unit – V

Listening   - Tanmay Bhakshi's ITU interview

Speaking   - Professional Etiquette

Grammar   - Common Errors
Vocabulary   - Word Analogy-II
Writing   - Report Writing
* Exercises apart from the text book shall also be referred for classroom tasks.

TEXT BOOKS:
1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book. 2001

REFERENCE BOOKS:
1. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

OUTCOMES:
Students will be able to:
1. draft coherent and unified paragraphs with adequate supporting details.
2. demonstrate problem solving skills, decision-making skills, analytical skills.
3. comprehend and apply the pre-interview preparation techniques for successful interview.
4. achieve expertise in writing resume and cover letter formats.
5. understand the steps of writing 'Reports and Abstract'.

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(R18A0022) MATHEMATICS-II

OBJECTIVES:

1. The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data and also used to find the roots of an equation.
2. To learn the concepts curve fitting, numerical integration and numerical solutions of first order ordinary differential equations.
3. Evaluation of improper integrals using Beta and Gamma functions.
4. Evaluation of multiple integrals.
5. In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector valued functions and their applications to line, surface and volume integrals.

UNIT – I:
Solutions of algebraic, transcendental equations and Interpolation
Solution of algebraic and transcendental equations: Introduction, Bisection Method, Method of false position, Newton Raphson method and their graphical interpretations.
Interpolation: Introduction, errors in polynomial interpolation, Finite differences - Forward differences, backward differences, central differences. Newton's formulae for interpolation, Gauss's central difference formulae. Interpolation with unevenly spaced points - Lagrange's Interpolation.

UNIT – II:
Numerical Methods
Numerical integration: Generalized quadrature - Trapezoidal rule, Simpson's $1/3^{rd}$ and Simpson's $3/8^{th}$ rules.
Numerical solution of ordinary differential equations: Solution by Taylor's series method, Euler's method, Euler's modified method, Runge-Kutta fourth order method.
Curve fitting: Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares.

Unit III:
Beta and Gamma functions
Introduction of improper integrals- Beta and Gamma functions - Relation between them, their properties, Evaluation of improper integrals using Beta and Gamma functions.

Unit IV:
Double and Triple Integrals
Double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar).

Unit V:
Vector Calculus

Introduction, Scalar point function and vector point function, Directional derivative, Gradient, Divergence, Curl and their related properties, Laplacian operator, Line integral - Work done, Surface integrals, Volume integral. Vector integral theoerem-Green's Theorem, Stoke's theorem and Gauss's Divergence Theorems (Statement & their Verification).

TEXT BOOKS:
1.   Higher Engineering Mathematics by B V Ramana ., Tata McGraw Hill.
2.   Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3.   Mathematical Methods by S.R.K Iyenger, R.K.Jain, Narosa Publishers.

REFERENCE BOOKS:
1.   Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2.   Advanced Engineering Mathematics by Michael Greenberg –Pearson publishers.
3.   Introductory Methods of Numerical Analysis by S.S. Sastry, PHI

OUTCOMES:
After learning the contents of this paper the student must be able to
1.   Find the roots of algebraic, non algebraic equations and predict the value of the data at an intermediate point from a given discrete data.
2.   Find the most appropriate formula for a guesses relation of the data variables using curve fitting and this method of analysis data helps engineers to understand the system for better interpretation and decision making.
3.   Find a numerical solution for a given differential equation.
4.   Evaluate multiple integrals and to have a basic understanding of Beta and Gamma functions..
5.   Evaluate the line, surface, volume integrals and converting them from one to another using vector integral theorems.

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(R18A0013) ENGINEERING CHEMISTRY

OBJECTIVES:

1. To apply the electrochemical principles in batteries, understand the fundamentals of corrosion and development of different techniques in corrosion control.
2. To analyze microscopic chemistry in terms of atomic and molecular orbitals.
3. To analyze water for its various parameters and its significance in industrial and domestic applications.
4. To impart the knowledge of organic reaction mechanisms which are useful for understanding the synthesis of organic compounds.
5. To analyze different types of fuels and their applications in various engineering fields.

UNIT-I:

Electrochemistry and Corrosion

Electrochemistry: Introduction to electrochemistry; Electrochemical cells - electrode potentials, construction and working of a galvanic cell, EMF and its applications - potentiometric titration; Nernst equation and its applications; Batteries - classification of batteries, primary cell - lithium cells and secondary cells - lead acid battery and lithium ion battery; Fuel cells - H_2-O_2 fuel cell, its applications and advantages.

Corrosion: Introduction, causes and effects of corrosion; Theories of corrosion- chemical (oxidation corrosion) and electrochemical corrosion, mechanism of electrochemical corrosion; Corrosion control methods - cathodic protection - sacrificial anodic protection & impressed current cathodic protection; Methods of application of metallic coatings - hotdipping - galvanizing & tinning, electroplating (Cu plating) and electroless plating (Ni plating) - advantages and applications of electroplating/electroless plating.

UNIT -II:

Atomic and Molecular Structure

Atomic and molecular orbitals; Postulates of molecular orbital theory - Linear Combination of Atomic Orbitals (LCAO); Molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2 and O_2; Metallic bonding, limitations of Valence Bond Theory (VBT).

Crystal field theory (CFT) – Salient features of CFT, crystal field splitting of transition metal ion d-orbitals in tetrahedral and octahedral geometries.

UNIT -III:

Water and its Treatment

Hardness of water- Types and units of hardness; Estimation of hardness of water by EDTA method; Softening of water by Ion exchange process; Potable water- specifications, methods of disinfection-chlorination and ozonization; Desalination of water by Reverse Osmosis.

UNIT-IV:

Organic Reactions

Introduction to Organic Reactions - Types of reactions; Substitution - Nucleophilic substitution reactions, mechanism of S_N1 and S_N2; Addition - electrophilic and nucleophilic addition reactions; addition of HBr to propene - Markownikoff and Anti-Markownikoff's additions; Elimination reactions - dehydrohalogenation of alkyl halides; Oxidation reactions - oxidation of alcohols using $KMnO_4$ and chromic acid; Reduction reactions - reduction of carbonyl compounds using $LiAlH_4$ and $NaBH_4$.

UNIT-V:

Energy Sources

Fuels- Definition, classification (solid, liquid & gaseous fuels) - characteristics of a good fuel; Coal - analysis of coal - proximate and ultimate analysis and their significance; Petroleum - refining, knocking - octane and cetane number, cracking - fluid bed catalytic cracking; Natural gas, LPG, CNG - constituents, characteristics and uses.

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain & M. Jain, Dhanpat Rai Publishing Company (P) Ltd, 16th Edition, New Delhi.
2. Engineering Chemistry by Prasanta Rath, B. Rama Devi, C. H. Venkata Ramana Reddy, Subhendu Chakroborty, Cengage Learning Publication, India Private Limited , 2018.

REFERENCE BOOKS:

1. University Chemistry by B. H. Mahan, Pearson, IV Edition.
2. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company (P) Ltd, New Delhi.
3. Reactions, Rearrangements and Reagents by S.N. Sanyal, Bharati Bhavan Publishers.

OUTCOMES:

The basic concepts included in this course will help the student to:

1. Understand the operating principles of various types of electrochemical cells, including fuel cells and batteries. Analyze and develop a technically sound, economic and sustainable solution to corrosion problems related to engineering service.
2. Achieve basic concepts of atomic, molecular and electronic changes related to conductivity and magnetism.
3. Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
4. Gain knowledge on synthesis of organic compounds by using different reaction mechanisms.
5. Comprehend the types of fuels, characteristics and combustion systems with emphasis on engineering applications.

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(R18A0502)OBJECT ORIENTED PROGRAMMING

OBJECTIVES
1. To teach the student the concepts of object oriented and generic programming.
2. To differentiate between object oriented programming and procedural programming.
3. To design applications using object oriented features
4. To teach the student to implement object oriented concepts

UNIT I
Introduction to Object Oriented Programming: Object oriented paradigm-Differences between Object Oriented Programming and Procedure oriented programming, Basic concepts of Object Oriented Programming, Encapsulation, Inheritance and Polymorphism, Benefits of OOP, Structure of a C++ program, namespace, Data types, C++ tokens, Identifiers, Variables, Constants, Operators, Control structures & Loops.

UNIT-II
Functions, Classes and Objects:
Introduction of Classes, Class Definition, Defining a Members,Objects,Access Control, Class Scope, Scope Resolution Operator, Inline functions, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friend Functions.

UNIT-III
Constructors, Destructors, Inheritance:
Introduction to Constructors, Default Constructors, Parameterized Constructors, Copy Constructors, Multiple Constructors in a Class, Destructors.
Inheritance :
Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi level Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

UNIT-IV
Pointers, Virtual Functions and Polymorphism:
Introduction to Memory management, new operator and delete operator, Pointers to objects, Pointers to Derived Classes, Polymorphism, Compile time polymorphism, Run time polymorphism, Virtual Functions, Overloading- Function Overloading, Operator overloading.

UNIT-V
Templates and Exception handling:
Introduction to Templates, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters.
Exception handling:

Basics of Exception Handling, Types of exceptions, Exception Handing Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions.

TEXT BOOKS:
1. Object Oriented Programming with C++ by Balagurusamy
2. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

REFERENCES:
1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Educ

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(R18A0201) BASIC ELECTRICAL ENGINEERING

OBJECTIVES:
1. This course introduces the basic concepts of electrical circuits & networks and their analysis which is the foundation for all the subjects in the electrical engineering discipline.
2. The emphasis is laid on the basic elements in electrical circuits.
3. Analysis of Circuits Which Includes Network Analysis & Network Theorems.
4. Analysis of Single Phase AC Circuits, Magnetic Circuits and Basic Treatment of Single Phase Transformers and DC Machines is introduced.

UNIT –I:
Introduction to Electrical Circuits: Concept of Circuit and Network, Types of elements, R-L-C Parameters, Independent and Dependent sources, Source transformation and Kirchhoff's Laws

UNIT –II:
Network Analysis: Network Reduction Techniques- Series and parallel connections of resistive networks, Star–to-Delta and Delta-to-Star Transformations for Resistive Networks, Mesh Analysis, and Nodal Analysis,
Network Theorems: Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem and Superposition theorem, Illustrative Problems.

UNIT-III:
Single Phase A.C. Circuits: Average value, R.M.S. value, form factor and peak factor for sinusoidal wave form, Complex and Polar forms of representation. Steady State Analysis of series R-L-C circuits. Concept of Reactance, Impedance, Susceptance, Admittance, Phase and Phase difference, Concept of Power Factor, Real, Reactive and Complex power, Illustrative Problems.

UNIT –IV:
Electrical Machines (elementary treatment only):
Single phase transformers: principle of operation, constructional features and emf equation.
DC.Generator: principle of operation, constructional features, emf equation. DC Motor: principle of operation, Back emf, torque equation.

UNIT –V:
Electrical Installations:
Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption and battery backup.

TEXT BOOKS:
1. Engineering Circuit Analysis - William Hayt, Jack E. Kemmerly, S M Durbin, Mc Graw Hill Companies.
2. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Electrical Machines – P.S.Bimbra, Khanna Publishers.

REFERENCE BOOKS:
1. Network analysis by M.E Van Valkenburg, PHI learning publications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Electrical Circuits by A. Sudhakar, Shyammohan and S Palli, Mc Graw Hill Companies.
4. Electrical Machines by I.J. Nagrath & D. P. Kothari, Tata Mc Graw-Hill Publishers.

OUTCOMES:
At the end of this course the student would get
1. A thorough knowledge of the basic RLC circuit elements
2. Understanding of the basic concepts of networks and circuits with RLC
3. Concepts of single phase AC circuits
4. Network theorems and their application to solve problems in Network analysis
5. Fundamentals Of Constructional Details And Principle Of Operation Of DC Machines And Transformers

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(R18A0083) ENGINEERING PHYSICS/ CHEMISTRY LAB
(Any 8 experiments compulsory)

OBJECTIVES
1. The engineering students are exposed in physics lab to understand physical parameters practically.
2. The list of experiments enables the students to know different branches like mechanics, optics and electronics.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in physics lab.

This course on physics lab is designed with 10 experiments in an academic year. It is common to all branches of Engineering in B.Tech 1st year.

LIST OF EXPERIMENTS: (Any eight experiments compulsory)
1. Torsional pendulum-Rigidity modulus of given wire.
2. Melde's experiment –Transverse and Longitudinal modes.
3. Stewart and Gee's method- Magnetic field along the axis of current carrying coil.
4. Spectrometer-Dispersive power of the material of a prism
5. Diffraction grating-using laser -Wave length of light.
6. Newton's Rings –Radius of curvature of Plano convex lens.
7. C-R circuit – Time Constant of RC circuit
8. Characteristics of LED.
9. Characteristics of a Solar cell.
10. Evaluation of numerical aperture of optical fiber.

Reference practical physics books:

1. Practical physics by **Dr. Aparna**, V.G.S.publications.
2. Engineering physics practical lab manual – **MRCET.**

OUTCOMES
1. The students learn the concepts of error, analyze and try to formulate new solutions to the problems related to engineering physics.
2. B.Tech students basically learning the mechanical behavior of the wire and practically determining the elastic constant. Transverse and longitudinal waves are practically studied. Variation of the magnetic fields along with terrestrial magnetism is practically studied.
3. Dispersion of the composite light is clearly observed by the students. Wavelengths of the source of light/laser are determined experimentally.
4. Opto electronic devices and their working are practically realized by the students. In addition the functioning of optical fiber is practically studied.
5. The students learn experimental skills to design new experiments suitable for requirements in different fields(industrial, medical, scientific fields etc.)

(R18A0083) ENGINEERING CHEMISTRY LAB
(Any Eight Experiment Compulsory)

OBJECTIVES

This course on chemistry lab is designed with 10 experiments in an academic year. It is common to all branches of Engineering in 1st B.Tech.

The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student. At the end of the course the student is expected to

1. Provide the students with a solid foundation in chemistry laboratory required to solve engineering problems.
2. Practical implementation of fundamental concepts.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in chemistry lab.

List of Experiments

Titrimetry:

1. Estimation of hardness of water by EDTA method.

Instrumental Methods:

Colorimetry:

2. Determination of Ferrous iron in cement by Colorimetric method
3. Estimation of Copper by Colorimetric method.

Conductometry:

4. Estimation of HCl by Conductometric titrations.
5. Estimation of Acetic acid in a mixture of HCl and Acetic acid by Conductometric titrations.

Potentiometry:

6. Estimation of HCl by Potentiometric titrations.
7. Estimation of Fe^{2+} by Potentiometry using $KMnO_4$.

Preparation:

8. Preparation of Aspirin.

Physical properties:

9. Determination of Viscosity of sample oil by Redwood Viscometer.
10. Determination of Surface Tension of a given liquid by Stalagmometer.

TEXT BOOK:

1. Inorganic quantitative analysis, Vogel
2. A text book on experiments and calculation in Engineering Chemistry by S.S. Dara

REFERENCE BOOKS:

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Text Book of Engineering Chemistry by R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.

OUTCOMES:

At the end of the course students will be able to

1. Estimate the total hardness present in a sample of water.
2. Select lubricants for various purposes and determine the surface tension of a given liquid.
3. Prepare synthetic drug molecule.
4. Determine the strength of an acid by conductometric and potentiometric methods.
5. Find the amount of Fe^{+2} and Cu^{2+} present in unknown substances using titrimetic and instrumental methods.

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(R18A0582)OBJECT ORIENTED PROGRAMMING LAB

OBJECTIVES:
1. To strengthen problem solving ability by using the characteristics of an object-oriented approach.
2. To design applications using object oriented features
3. To handle Exceptions in programs.
4. To teach the student to implement object oriented concepts

Week 1:
Basic C++ Programs
Week2:
a) Write a C++ program to find the sum of individual digits of a positive integer.
b) Write a C++ program to generate the first n terms of the sequence.
Week 3:
a) Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
b) Write a C++ program to find both the largest and smallest number in a list of integers.
Week 4:
a) Write a C++ program to sort a list of numbers in ascending order.
b) Write a Program to illustrate New and Delete Keywords for dynamic memory allocation
Week 5
a) Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
b) Program to illustrate default constructor, parameterized constructor and copy constructors
c) Write a Program to Implement a Class STUDENT having Following Members:

Member	Description
Data members	
Sname	Name of the student
Marks array	Marks of the student
Total	Total marks obtained
Tmax	Total maximum marks
Member functions	
Member	Description
ssign()	Assign Initial Values
compute()	to Compute Total, Average
display()	to Display the Data.

Week 6:
a) Write a Program to Demonstrate the i)Operator Overloading.ii) Function Overloading.
b) Write a Program to Demonstrate Friend Function and Friend Class.

Week 7:
a) Write a Program to Access Members of a STUDENT Class Using Pointer to Object Members.
b) Write a Program to Generate Fibonacci Series use Constructor to Initialize the Data Members.

Week 8:
Revision laboratory

Week 9
Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.
d) Subtraction of matrices. e) Multiplication of matrices

Week 10
 Write C++ programs that illustrate how the following forms of inheritance are supported:
a)Single inheritance b)Multiple inheritance c)Multi level inheritance d)Hierarchical
   inheritance

Week 11
a.)Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
b) Write a Program to Invoking Derived Class Member Through Base Class Pointer.

Week 12
a) Write a Template Based Program to Sort the Given List of Elements.
b) Write a C++ program that uses function templates to find the largest and smallest number in a list of integers and to sort a list of numbers in ascending order.

Week 13
a) Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.
b) Write a Program to Demonstrate the Catching of All Exceptions.

Week 14
Revision

TEXT BOOKS:
 1. Object Oriented Programming with C++ by Balagurusamy
 2. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

REFERENCE BOOKS:
 1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
 2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Education.

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(R18A0281) BASIC ELECTRICAL ENGINEERING LAB

OBJECTIVES:

To Design Electrical Systems.

1. To Analyze A Given Network By Applying Various Network Theorems.
2. To Expose The Students To The Operation Of DC Generator
3. To Expose The Students To The Operation Of DC Motor and Transformer.
4. To Examine The Self Excitation In DC Generators.

CYCLE –I

1. Verification of KVL and KCL.
2. Verification of Thevenin's theorem.
3. Verification of Norton's theorem.
4. Verification of Superposition theorem.
5. Verification of Maximum power transfer theorem.
6. Verification of Reciprocity theorem.

CYCLE-II

7. Magnetization characteristics of DC shunt generator.
8. Swinburne's test on DC shunt machine.
9. Brake test on DC shunt motor.
10. OC & SC tests on single phase transformer.
11. Load test on single phase transformer.

NOTE: Any 10 of Above Experiments Are To Be Conducted

OUTCOMES:

After successfully studying this course, students will:

1. Explain the concept of circuit laws and network theorems and apply them to laboratory measurements.
2. Be able to systematically obtain the equations that characterize the performance of an electric circuit as well as solving both single phase and DC Machines
3. Acknowledge the principles of operation and the main features of electric machines and their applications.
4. Acquire skills in using electrical measuring devices.

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B.TECH- I YEAR – II- SEM - EEE   L T/P/D C
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(R18A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVE
(Mandatory Course)

OBJECTIVES:

This introductory course input is intended:

1. to help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. to facilitate the development of a holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of value based living in a natural way.
3. to highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature.

UNIT - I:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education.

Self Exploration - what is it? - its content and process; 'Natural Acceptance' and Experiential Validation - as the mechanism for self exploration. Continuous Happiness and Prosperity

A look at basic Human Aspirations- Right understanding, Relationship and Physical Facilities - the basic requirements for fulfillment of aspirations of every human being with their correct priority.

Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

UNIT - II:

Understanding Harmony in the Human Being - Harmony in Myself! : Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.

 Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Swasthya.

UNIT - III:

Understanding Harmony in the Family and Society - Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Understanding the meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.

Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astiva as comprehensive Human Goals. Visualizing a universal harmonious order in society - Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family!

UNIT - IV:
Understanding Harmony in the nature and Existence - Whole existence as Coexistence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature - recyclability and self-regulation in nature.

Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

UNIT - V:
Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:
  a. Ability to utilize the professional competence for augmenting universal human order.
  b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
  c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

TEXT BOOKS:
  1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
  2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.

REFERENCE BOOKS:
  1. Ivan IIlich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
  2. E. F. Schumancher, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
  3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
  4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
  5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
  6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
  7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
  8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
  9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.

10. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & Other Literature:
1. Value Education website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyofstuff.com
3. AI Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charle Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology - the Untold Story

OUTCOMES:
1. The students will be able to obtain happiness and prosperity in their life.
2. They will develop harmony at all levels.
3. They can have satisfying human behavior throughout their life.

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(R18A0023) MATHEMATICS – III

OBJECTIVES:

To learn

1. The expansion of a given function by Fourier series.
2. The Fourier sine and cosine transforms, properties, inverse transforms, and finite Fourier transforms.
3. Differentiation, integration of complex valued functions and evaluation of integrals using Cauchy's integral formula.
4. Taylor's series, Laurent's series expansions of complex functions and evaluation of integrals using residue theorem.
5. Transform a given function from z - plane to w – plane. Identify the transformations like translation, magnification, rotation, reflection, inversion, and Properties of bilinear transformations.

UNIT – I:

Fourier series

Definition of periodic function, Fourier expansion of periodic functions in a given interval of length 2π, Fourier series of even and odd functions, Half-range Fourier sine and cosine expansions, Fourier series in an arbitrary interval.

UNIT – II:

Fourier Transforms

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms, properties. Inverse transforms and Finite Fourier transforms.

UNIT – III:

Analytic functions

Complex functions and its representation on Argand plane, Concepts of limit, continuity, differentiability, Analyticity, and Cauchy-Riemann conditions, Harmonic functions – Milne – Thompson method. Line integral – Evaluation along a path and by indefinite integration – Cauchy's integral theorem (singly and multiply connected regions) – Cauchy's integral formula – Generalized integral formula.

UNIT – IV:

Singularities and Residues

Radius of convergence, expansion of given function in Taylor's series and Laurent series. Singular point –Isolated singular point, pole of order m and essential singularity. Residues – Evaluation of residue by formula and by Laurent series. Residue theorem- Evaluation of improper integrals of the type

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(a) $\displaystyle\int_{-\infty}^{\infty} f(x)\,dx$ (b) $\displaystyle\int_{c}^{c+2\pi} f(cos\Theta, sin\Theta)\,d\Theta$

UNIT – V:
Conformal Mappings
Conformal mapping: Transformation of z-plane to w-plane by a function, conformal transformation. Standard transformations- Translation; Magnification and rotation; inversion and reflection, Transformations like e^z , log z, z^2, and Bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given (cross ratio).

TEXT BOOKS:
1. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
2. Higher Engineering Mathematics by B.V Ramana , Tata McGraw Hill.
3. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.

REFERENCES:
1. Complex Variables and Applications by James W Brown and Ruel Vance Churchill-Mc Graw Hill
2. Mathematics-III by T K V Iyenger ,Dr B Krishna Gandhi, S Ranganatham and Dr MVSSN Prasad, S chand Publications.
3. Advanced Engineering Mathematics by Michael Greenberg –Pearson publishers.

COURSE OUTCOMES:
After going through this course the students will be able to
1. Find the expansion of a given function by Fourier series in the given interval.
2. Find Fourier sine, cosine transforms and inverse transformations.
3. Analyze the complex functions with reference to their analyticity and integration using Cauchy's integral theorem.
4. Find the Taylor's and Laurent series expansion of complex functions. Solution of improper integrals can be obtained by Cauchy's-Residue theorem.
5. Understand the conformal transformations of complex functions can be dealt with ease.

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(R18A0401) ELECTRONIC DEVICES AND CIRCUITS

OBJECTIVES

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

1. To familiarize the student with the principal of operation, analysis and design of junction diode. BJT and FET transistors and amplifier circuits.
2. To understand diode as a rectifier.
3. To study basic principal of filter of circuits and various types

UNIT-I

P-N Junction diode: Diode equation, Volt-Ampere characteristics, Temperature dependence of V-I characteristic, Ideal versus practical –resistance levels (static and dynamic), Transition and diffusion capacitances, Diode equivalent circuits, Breakdown mechanisms, Diode as – switch, clipper, clamper

RECTIFIERS: P-N Junction as a rectifier, Half wave rectifier, Full wave rectifier, Bridge rectifier, Capacitor filter

UNIT-II

BIPOLAR JUNCTION TRANSISTOR: Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations. BJT Hybrid Model: h-parameter representation of a transistor, Operating point, the D.C and A.C Load lines, Fixed bias, Collector to base bias, Self-bias techniques for stabilization, Stabilization factors, (s, s^I, s^{II}), Bias Compensation using diode and transistor , (Compensation against variation in V_{BE}, I_{CO}).

UNIT-III

TRANSISTOR AMPLIFIERS: Thermal runaway and Thermal stability**,** Conversion of h-parameters**,** Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of A_i, R_i ,A_v,and R_o

UNIT-IV

FIELD EFFECT TRANSISTOR AND FET AMPLIFIER

JFET-Construction, principle of Operation, Volt –Ampere characteristics, Pinch- off voltage. Small signal model of JFET. FET as Voltage Variable Resistor, Comparison of BJT and FET. MOSFET-Construction, Principle of Operation and symbol, MOSFET characteristics in Enhancement and Depletion modes.

UNIT V:
FET Amplifiers: FET Biasing, Common source Amplifier, Common Drain Amplifier.
Special purpose Devices: Principal of operation and Characteristics- Zener diode, Tunnel Diode, Varactar Diode, photo diode, SCR And UJT

TEXT BOOKS:
1. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
2. Electronic Devices and Circuits Theory, Boylsted, Prentice Hall Publications.
3. Electronic Devices and Circuits, S.Salivahanan,N.Suresh kumar, McGraw Hill.
4. Electronic Devices and Circuits,Balbir kumar ,shail b.jain, PHI Privated Limted, Delhi.

REFERENCE BOOKS:
1. Electronic Devices and Circuits,K.Lal Kishore B.S Publications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3**.** Electronic Devices and Circuits,A.P Godse, U.A Bakshi , Technical Publications
4. Electronic Devices and Circuits K.S. Srinivasan Anurdha Agencies

OUTCOMES:
At the end of the course, the student will be able to:
1. Understand and analyse the different types of diodes, operation and its characteristics
2. Design and analyse the DC bias circuitry of BJT and FET
3. Design biasing circuits using diodes and transistors.
4. To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

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(R18A0202) ELECTRICAL CIRCUIT ANALYSIS

OBJECTIVES:

1. This course introduces the analysis of transients in electrical systems, to understand three phase circuits, to evaluate network parameters of given electrical network, to draw the locus diagrams and to know about the network functions

2. To prepare the students to have a basic knowledge in the analysis of Electric Networks

UNIT-I

D.C Transient Analysis: Transient response of R-L, R-C, R-L-C circuits (Series and parallel combinations) for D.C. excitations, Initial conditions, Solution using differential equation and Laplace transform method.

UNIT - II

A.C Transient Analysis: Transient response of R-L, R-C, R-L-C circuits (Series and parallel combinations) for sinusoidal excitations, Initial conditions, Solution using differential equation and Laplace transform method.

UNIT - III

Three Phase Circuits: Phase sequence, Star and delta connection, Relation between line and phase voltages and currents in balanced systems, Analysis of balanced and Unbalanced three phase circuits

UNIT – IV

Locus Diagrams: Series and Parallel combination of R-L, R-C and R-L-C circuits with variation of various parameters.

Resonance: Resonance for series and parallel circuits, concept of band width and Q factor.

UNIT - V

Network Parameters: Network functions driving point and transfer impedance function networks- poles and zeros –necessary conditions for driving point function and for transfer function Two port network parameters – Z, Y, ABCD and hybrid parameters and their relations– 2- port network parameters using transformed variables.

TEXT BOOKS:

1. William Hart Hayt, Jack Ellsworth Kemmerly, Steven M. Durbin (2007), Engineering Circuit Analysis, 7 th edition, McGraw-Hill Higher Education, New Delhi, India
2. Joseph A. Edminister (2002), Schaum's outline of Electrical Circuits, 4th edition, Tata McGraw Hill Publications, New Delhi, India

3. A.Sudhakar, Shyammohan S. Palli (2003), Electrical Circuits, 2nd Edition, Tata McGraw Hill, New Delhi

REFERENCE BOOKS:

1. C. L. Wadhwa(2008), Electric Circuits Analysis, 2 nd edition, New Age International Publications, New Delhi.
2. A. Chakrabarthy(2010), Circuit Theory, 5th edition, DhanpatRai& Sons Publications, New Delhi.
3. Van Valkenburg, M. E. (1974), Network Analysis, 3rd Edition, Prentice Hall of India, New Delhi.
4. A Text Book On Electrical Technology. –B L THERAJA, Vol 1, S.Chand Publications.

OUTCOMES:
1. After going through this course the student gets a thorough knowledge on basic parameters of two port network.
2. Will able to articulate in working of various components of a circuit.
3. Will be familiar with ac and dc circuits solving.
4. Ability to measure Three phase voltages and current, active, reactive powers.
5. Ability to convert Three phase Star to Three phase Delta circuits and Vice-Versa

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(R18A0203) ELECTRICAL MACHINES - I

OBJECTIVES:

1. To introduce 'Electrical machines' which is is one of the important Subjects of the Electrical Engineering course.
2. To understand the basic working principle, constructional details, operational features & characteristics and testing of different types of DC generators and Motors which are widely used in industry
3. To expose the students to the concepts of various types of electrical machines and their applications.

UNIT – I:

D.C Generators: Action of commutator – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – Problems.

Armature Reaction:

Armature reaction – Cross magnetizing and de-magnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation.

UNIT – II:

Types of D.C Generators & Load Characteristics: Methods of Excitation – separately excited and self excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self excited and remedial measures. Load characteristics of shunt, series and compound generators – parallel operation of d.c series generators – use of equalizer bar and cross connection of field windings – load sharing.

UNIT – III:

D.C. Motors: D.C Motors – Types of DC motors, characteristics and application of separately excited, shunt, series and compound motors –Armature reaction and commutation.

UNIT – IV:

Speed control of DC Motors: Armature voltage and field flux control methods. Ward-Leonard system. Principle of 3 point and 4 point starters – protective devices.

UNIT – V:

Testing of D.C. Machines: Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency. Methods of Testing – direct, indirect and regenerative testing – brake test – Swinburne's test – Hopkinson's test – Field's test – Retardation test – separation of stray losses in a DC motor test.

TEXT BOOKS:
1. Electrical Machines, P.S. Bimbra, Khanna Publishers.
2. Principles of Electrical Machines, V. K. Mehta, Rohit Mehta, S. Chand Publishing.
3. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers

REFERENCE BOOKS:
1. Electric Machines, Mulukutla S. Sarma, Mukesh K. Pathak, Cengage Learning.
2. Fundamentals of Electric Machines, B. R. Gupta, Vandana Singhal, New Age International Publishers.
3. Electrical Machines, M. V. Deshpande, PHI Learning Private Limited.
4. Electrical Machines, R. K. Srivastava, Cengage Learning.

OUTCOMES:
At the end of this course the student would get
1. Basic knowledge on principles of electromechanical energy conversion
2. Knowledge on the Constructional features of DC Generators and DC motors
3. Full understanding of the basic principle of operation of these machines
4. Clear understanding of Operational characteristics and speed control methods of these machines.
5. Testing of different types of DC Generators and DC motors

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(R18A0462)DIGITAL ELECTRONICS

OBJECTIVES:
The main objectives of the course are:
1. To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions.
2. To introduce the methods for simplifying Boolean expressions.

3. To outline the formal procedures for the analysis and design of combinational and sequential circuits.
4. To introduce the concept of memories and programmable logic devices.
5. To illustrate the concept of synchronous and asynchronous sequential circuits.

UNIT I
BINARY SYSTEMS AND LOGIC GATES:
Binary Systems: The Advantage of Binary, Number Systems, The Use of Binary in Digital Systems,AND, OR, NOT, NAND, NOR, Exclusive-OR, Exclusive-NOR and Exclusive-NAND implementations of Logic Functions using gates, NAND-NOR implementations.

UNIT II
MINIMIZATION TECHNIQUES:

Minimization Techniques: Boolean postulates and laws-De-Morgan's Theorem-Principle of Duality-Boolean expression-Minimization of Boolean expressions-Minterm-Maxterm-Sum of Products (SOP)-Product of Sums (POS)-Karnaugh map minimization-Don't care conditions-Quine Mc-Cluskey method of minimization.

UNIT III
COMBINATIONAL CIRCUITS:

Design Procedure-Half Adder-Full Adder-Half Subtractor-Full Subtractor-Parallel binary adder-Parallel Binary Subtractor-Multiplexer/ Demultiplexer-Decoder-Encoder.

UNIT IV
SEQUENTIAL CIRCUITS:
Latches, Flip-flops-SR, JK, D, T and Master-Slave-Characteristic table and equation-Application Table-Edge Triggering-Level Triggering-Realization of one flip-flop using other flip-flops-serial adder/subtractor-Asynchronous Counter-Asynchronous Up/Down Counter, Decade counter-Synchronous Counters-Synchronous Up/Down Counters, Decade Counters

UNIT V
MEMORY DEVICES:
Classification of Memories-ROM_ROM Organization, PROM-EPROM-EEPROM-EAPROM, RAM-RAM Organization-Write operation-Read Operation-Programmable Logic Devices-Programmable Logic Array (PLA), Programmable Array Logic (PAL)-Implementation of combinational logic circuits suing ROM, PLA, PAL

TEXT BOOKS:
1. M Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India PVt., Ltd., 2008/Pearson Education (Singapore) Pvt., Ltd., New Delhi, 2003.
2. Donald P Leach and Albert Paul Malvino, "Digital Principles and Applications", 6th Edition, TMH, 2006.

REFERENCES:
1. John F Wakerly. "Digital Design, Fourth Edition, Pearson/PHI, 2008
2. John M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2006
3. Charles H Roth, "Fundamentals of Logic Design", 6th Edition, Thomson Learning,2013
4. Thomas L Floyd, "Digital Fundamentals", 10th Edition, Pearson Education Inc, 2011.
5. Donald D Givone, "Digital Principles and Design", TMH, 2003.

OUTCOMES:
After the completion of the course, the student will be able to:
1. Analyze different methods used for simplification of Boolean expressions
2. Design and implement Combinational and Sequential circuits.
3. Design and implement Synchronous and Asynchronous Sequential Circuits.

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(R18A0366)BASIC MECHANICAL ENGINEERING

OBJECTIVES:
1. To expose the students to the fundamental thrust areas in Mechanical Engineering that are relevant to other core branches of engineering
2. To introduce the key concepts of Thermodynamics essential for the study of IC engines , Air-conditioning ,Refrigeration etc.
3. To understand the working principle of different types turbines, pumps and motors that work on the principle of steam hydraulic and pneumatic means
4. Study and develop basic understanding of important mechanisms, drives and materials used in the engineering and consumer industry in conjunction with other electrical, electronics, computers and control systems

UNIT-I:
Thermodynamics: Laws of Thermodynamics, significance and applications of laws of thermodynamics; entropy, available energy; Clausius inequality; principle of increase of entropy; Ideal and real gas equations; Analysis of Carnot cycle, Otto cycle , Diesel cycle and Brayton cycle; Efficiency of these cycles.

UNIT-II: Energy conversion devices: Boilers, Steam turbines, Gas turbines and Hydraulic turbines; Working principle of two stroke and four stroke I.C. Engines (Diesel and Petrol), Reciprocating and centrifugal pumps, rotary pumps, reciprocating and centrifugal compressors, fans, blowers, rotary compressors; Hydraulic & Air motor.

UNIT-III: Refrigeration and Air Conditioning: Vapour compression and absorption refrigeration systems, COP, Study of household refrigerator, Energy Efficiency Rating, Psychrometry, Psychrometric processes, window air conditioner, split air conditioner. Ratings and selection criteria of above devices. Refrigerants and their impact on environment.

UNIT-IV:
Engines and Power Transmission Devices in Automobiles, Different types of engines used in automobiles, major components and their functions (Description only); Fuels; Recent developments: CRDI, MPFI, Hybrid engines. Belts and belt drives and simple mechanisms, Chain drive; Rope drive; Gears & gear trains; friction clutch (cone and single plate), brakes and bearings (types and applications only); Applications of these devices

UNIT-V: Materials and manufacturing processes: Engineering materials, Classification, properties, Alloys and their Applications; Casting, Sheet metal forming, Sheet metal cutting, Forging, Rolling, Extrusion, Metal joining processes - Powder metallurgy.

TEXT BOOKS:
1. Fundamentals Of Mechanical Engineering – G S Sawhney– Phi
2. Basic Mechanical Engineering – Balachandran Owl Books
3. Basic Mechanical Engineering – J Benjamin Pentex Books

REFERENCE BOOKS:
1. An Introduction To Mechanical Engineering Part I – Michael Clifford, Kathy Simmons And Philip Shipway. Crc Press
2. Basic And Applied Thermodynamics – P. K Nag – Tata Mcgraw-Hill
3. Basic Mechanical Engineering - Pravin Kumar
4. Fundamentals Of Ic Engines- Gill, Smith And Zuirys - Oxford And Ibh Publishing Company Pvt. Ltd. New Delhi. Crouse, Automobile Engineering, Tata Mc-Graw-Hill, New Delhi.
5. Roy And Choudhary, Elements Of Mechanical Engineering, Media Promoters & Publishers Pvt. Ltd., Mumbai.
6. Automobile Engineering, Crouse- Tata Mc-Graw-Hill, New Delhi

OUTCOMES:
At the end of the course the student will be able to
1. Understand the inter dependence of the thrust areas in Mechanical Engineering with other core engineering subjects in today's engineering Industry.
2. Get a basic knowledge of Thermodynamics and understand it's application in IC engines, Air conditioning and refrigeration.
3. Be conversant with all basic mechanisms, drives, brakes, bearings etc that are essential parts in today's engineering products and consumer systems.
4. Be familiar with all the important materials and their technical characteristics that find use in all industrial and consumer products.

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(R18A0481) ELECTRONIC DEVICES AND CIRCUITS LAB

PART A: (Only for Viva-voce Examination)
Electronic Workshop Practice (In 3 Lab Sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, MOSFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
   i. Multimeters (Analog and Digital)
   ii. Function Generator
   iii. Regulated Power Supplies
   iv. CRO.

PART B: (For Laboratory Examination – Minimum of 10 experiments)

1. P-N junction diode characteristics
2. Zener diode characteristics and Zener as voltage regulator
3. Half -Wave Rectifier with and without filter
4. Full - Wave Rectifier with and without filter
5. Input and output characteristics of transistor in CB configuration
6. Input and output characteristics of transistor in CE configuration
7. FET Characteristics
8. h-parameters of CE configuration
9. Frequency response of CE amplifier
10. Frequency response of CC amplifier
11. Frequency response of common source FET amplifier
12. UJT CHARACTERISITCS

PART C: Equipment required for Laboratories:

1. Regulated Power supplies (RPS)   0-30 V
2. CRO's   0-20 MHz
3. Function Generators   0-1 MHz
4. Multimeters
5. Decade Resistance Boxes/ Rheostats
6. Decade Capacitance Boxes
7. Ammeters (Analog or Digital)   0-20 μA, 0-50μA, 0-100μA, 0-200μA, 0-10 mA
8. Voltmeters (Analog or Digital)   0-50V, 0-100V, 0-250V
9. Electronic Components   Resistors, Capacitors, BJT's, LCD's, SCR's, UJTs, FET's,LED's, MOSFET's, Diodes- Ge & Si type, Transistors – NPN, PNP type

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(R18A0393)BASIC MECHANICAL ENGINEERING LAB

OBJECTIVES:

1. To impart practical knowledge on the performance evaluation methods of Various internal combustion engines, flow measuring equipment and hydraulic turbines and pumps.

SECTION A - THERMAL ENGINEERING LAB

1. I.C. Engines valve / port timing diagrams.
2. I.C. Engines performance test on 4 -stroke Diesel engine.
3. Determination of FHP by retardation and motoring test on IC engine
4. I.C. Engines heat balance on petrol / Diesel engines.
5. Study of boilers
6. I.C. Engines performance test on 2-stroke petrol engine

SECTION B – HYDRAULIC MACHINES LAB

1. Impact of jets on Vanes.
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine.
4. Performance Test on Kaplan Turbine.
5. Performance Test on Single Stage Centrifugal Pump.
6. Performance Test on Reciprocating Pump.

NOTE: Conduct Any 10 Experiments From Above 12 Experiments

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MANDATORY COURSE – II
(R18A0004) FOREIGN LANGUAGE-FRENCH

OBJECTIVES:
1. To inculcate the basic knowledge of the French language.
2. To hone the basic sentence constructions in day to day expressions for communication in their vocation.
3. To culminate their major with evidence of a purposeful education.

UNIT - I:
Speaking: Introduction to the French language and culture – Salutations - French alphabet - Introducing people
Writing: Understand and fill out a form
Grammar: The verbs "to be ' and "to have '' in the present tense of the indicative
Vocabulary: The numbers from 1 to 20 - Professions – Nationalities

UNIT - II:
Speaking: Talk about one's family – description of a person - express his admirations and preferences - express possession - express negation
Writing: Write and understand a short message
Grammar: Nouns (gender and number) - Articles - The –er verbs in the present - Possessive adjectives Qualifying adjectives
Vocabulary: The family – Clothes - Colors - The numbers from 1 to 100 - The classroom

UNIT - III
Speaking: Talk about your daily activities - be in time - ask and indicate the date and time - talk about sports and recreation - express the frequency
Writing: A letter to a friend
Grammar: The expression of time – The –ir verbs in the present - The verbs do, go, take, come, -   Adverbs - Reflexive verbs
Vocabulary: The days and months of the year -   The sports – Hobbies

UNIT - IV
Speaking: Express the quantity - ask and give the price - express the need, the will and the capacity - compare (adjective) - speak at the restaurant / in the shops
Writing: A dialogue between a vendor and a customer at the market
Grammar: Verbs "to want", "to can" - Express capacity / possibility - Express will / desire – the future tense
Vocabulary: The food – Meals - Fruits and vegetables – The parts of the body

UNIT - V

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the weather / ask the weather - ask the opinion - give your opinion - express your agreement or disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation and necessity in the present

Vocabulary: Seasons – Holidays - The city – Furniture

TEXT BOOKS :
1. Apprenons le Français 1& 2, New Saraswati House, 2015
2. A propos, A1, Langers International, 2010
3. [Easy French Step-by-step](#) by Myrna Bell Rochester

REFERENCE BOOKS:
1. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language
2. Ã L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier-Berman, Anne C. Cummings.

OUTCOMES:
1. The students will be able to communicate in French at A1 level.
2. The student will have an advantage in the competitive job market.
3. This course benefits the graduates when pursuing study *opportunities* in the countries where French is the official language.

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(R18A0204)ELECTRICAL MACHINES – II

OBJECTIVES:

1. This subject is an extension of Electrical machines- I and deals with the basic working principle, constructional details, operational features & characteristics.
2. Discuss the testing of different types of Transformers and Induction motors which form major part of today's industrial drives and agricultural pump sets.

UNIT-I

Single Phase Transformers:

Single phase transformers- - types - equivalent circuit – operation on no load and on load-phasor diagrams –losses- minimization of hysteresis and eddy current losses-efficiency-all day efficiency-regulation-effect of variations of frequency and supply voltage on iron losses.

UNIT-II

Testing of Single Phase Transformer and Autotransformer:

OC and SC tests – Sumpner's test – predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios – auto transformers-equivalent circuit –comparison with two winding transformers.

UNIT-III

Polyphase Transformers:

Poly phase transformers – Polyphase connections – Y/Y, Y/D, D/Y, D/D and open D, Third harmonics in phase voltages-three winding transformers-tertiary windings-determination of Zp, Zs and Zt transients in switching – off load and on load tap changing; Scott connection.

UNIT-IV

Polyphase Induction Motors:

Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field – principle of operation – rotor emf and rotor frequency – rotor reactance, rotor current and Power factor at standstill and during operation. Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation – expressions for maximum torque and starting torque – torque slip characteristic – double cage and deep bar rotors – equivalent circuit – phasor diagram – crawling and cogging

UNIT-V

Circle Diagram of Induction Motors& Speed control methods:

Circle diagram-no load and blocked rotor tests-predetermination of performance-methods of starting and starting current and torque calculations.Speed control-change of frequency; change of poles and methods of consequent poles; cascade connection.

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injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation

TEXTBOOKS:

1. Electric machinery – A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition.
2. Electrical machines-PS Bhimbra, Khanna Publishers.
3. Electric Machines, I. J. Nagrath & D. P. Kothari, Tata Mc Graw Hill Publishers.

REFERENCEBOOKS:

Performance and Design of AC Machines by MG.Say, BPB Publishers.
1. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2ndedition.
2. Electromechanics-II (transformers and induction motors) S. Kamakashaiah Hitech publishers.
3. A Textbook of Electrical Technology:volume 2 AC & DC Machines by B.L.THERAJA,A.K.THERAJA.

OUTCOMES:

At the end of this course the student would get
1. Basic knowledge on principles of electromechanical energy conversion
2. Knowledge on the Constructional features of Transformers and Induction motors
3. Full understanding of the basic principle of operation of these machines
4. Clear understanding of Operational characteristics and speed control methods of Induction motors.
5. Testing of different types of Transformers and Induction motors

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(R18A0205)POWER SYSTEMS-I

OBJECTIVES:

1. To introduce and describe the various methods of power generation like hydro, thermal, nuclear and gas generating stations.
2. To study and understand the various parameters concerning the design installation and operation of A.C. Transmission lines
3. To illustrate the economic aspects of power generation and tariff methods.

UNIT- I

Thermal Power Stations: Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses. Brief description of TPS components: Economizers, Boilers, Super heaters, Turbines, Condensers, Chimney and cooling towers **Gas and Nuclear Power Stations:** Nuclear Power Stations: Nuclear Fission and Chain reaction. - Nuclear fuels. - Principle of operation of nuclear reactor.-Reactor Components: Moderators, Control rods, Reflectors and Coolants. - Radiation hazards: Shielding and Safety precautions. - Types of Nuclear reactors and brief description of PWR, BWR and FBR.

Gas Power Stations: Principle of Operation and Components (Block Diagram Approach Only)

UNIT - II

Hydroelectric Power Stations: Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies.

Hydraulic Turbines: Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design - draft tube- theory- functions and efficiency.

UNIT III:

TRANSMISSION LINE PARAMETERS:

Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems. Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems

UNIT IV:

PERFORMANCE OF SHORT, MEDIUM AND LONG TRANSMISSION LINES: Classification of Transmission Lines - Short, medium and long line and their model representations - Nominal-T, Nominal-Pie and A, B, C, D Constants for Symmetrical & Asymmetrical Networks, Numerical Problems. Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems. Long Transmission Line-Rigorous

Solution, evaluation of A,B,C,D Constants, Interpretation of the Long Line Equations, Incident, Reflected and Refracted Waves -Surge Impedance and SIL of Long Lines
Wave Length and Velocity of Propagation of Waves - Representation of Long Lines - Equivalent-T and Equivalent Pie network models (numerical problems).

UNIT-V:
POWER SYSTEM TRANSIENTS AND VARIOUS FACTORS GOVERNING THE PERFORMANCE OF TRANSMISSION LINE
Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short- circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems). Bewley's Lattice Diagrams (for all the cases mentioned with numerical examples). Skin and Proximity effects - Description and effect on Resistance of Solid Conductors -Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

TEXT BOOKS:
1. "C. L. Wadhwa", "Generation and utilization of Electrical Energy", New age International (P) Limited, Publishers 1997.
2. "C. L. Wadhwa", "Electrical Power Systems", New age International (P) Limited, Publishers 1997.
3. "M. L. Soni, P. V. Gupta, U. S. Bhatnagar and A. Chakrabarhty", "A Text Book on Power System Engineering", Dhanpat Rai and Co. Pvt. Ltd, 1999.

REFERENCE BOOKS:
1. "M.V. Deshpande", "Elements of Power Station design and practice" , Wheeler Publishing, 3rd Edition 1999.
2. "S. N. Singh", "Electrical Power Generation, Transmission and Distribution", PHI, 2003.
3. "V.K Mehta and Rohit Mehta", "Principles of Power Systems", S. Chand& Company Ltd, New Delhi, 2004.

OUTCOMES:
At the end of this course the student would
1. Get Basic understanding of different types power generation stations
2. Be able to draw the layout of different types of power plants like hydro power plant, thermal power station, Nuclear power plant and gas power plant
3. Get a clear understanding of different transmission line parameters, installation and their performance details.
4 Understand the various economic aspects of the power plant erection, operation and different tariff method

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(R18A0206)ELECTRO MAGNETIC FIELDS

OBJECTIVES:
1. To introduce the concepts of electric field, magnetic field.
2. Applications of electric and magnetic fields in the development of the theory for Power transmission lines and electrical machines.

UNIT – I
Electrostatics: Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field– Electric Potential – Properties of potential function – Potential gradient – Gauss's law – Application of Gauss's Law – Maxwell's first law, div (D)=ρv – Laplace's and Poison's equations – Solution of Laplace's equation in one variable. Electric dipole – Dipole moment– potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field– Behavior of conductors in an electric field – Conductors and Insulators

UNIT – II
Dielectrics & Capacitance: Behavior of conductors in an electric field – Conductors and Insulators – Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions – Capacitance – Capacitance of parallel plates – spherical co-axial capacitors with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of continuity

UNIT – III
Magneto Statics: Static magnetic fields – Biot-Savart's law – Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current Carrying wire – Relation between magnetic flux and magnetic flux density – Maxwell's second Equation, div(B)=0,
Ampere's Law & Applications: Ampere's circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere's circuital law – Maxwell's third equation, Curl (H)=Jc

UNIT – IV
Force in Magnetic fields and Magnetic Potential: Magnetic force Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors – Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a

current loop placed in a magnetic field.Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson's equations. Self and Mutual inductance – Neumann's formulae – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field. Introduction to permanent magnets, their characteristics and applications.

UNIT – V
Time Varying Fields: Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, Curl (E)=-dB/dt – Statically and Dynamically induced EMFs – Simple problems -Modification of Maxwell's equations for time varying fields – Displacement current

TEXT BOOKS:
1. "William H. Hayt& John. A. Buck", "Engineering Electromagnetics" ,Mc. Graw-Hill Companies, 7th Edition, 2009.
2. "Sadiku", "Electromagnetic Fields", Oxford Publications, 4th Edition, 2009.

REFERENCE BOOKS:
1. "CR Paul and S. A. Nasar", "Introduction to Electromagnetic", Mc-Graw Hill Publications, 3rd Edition, 1997.
2. "Nathan Ida", "Engineering Electromagnetic", Springer (India) Pvt. Ltd. 2nd Edition, 2015.
3. "D J Griffiths", "Introduction to Electro Dynamics", Prentice-Hall of India Pvt. Ltd, 3rd edition, 1999.
4. "J. D Kraus", "Electromagnetics", Mc Graw-Hill Inc. 4th edition, 1992.

OUTCOMES:
Upon completion of course, student will be able to Apply vector calculus to static electric – magnetic fields.
1. Compute the force, fields & Energy for different charge & current configurations & evaluate capacitance and inductance.
2. Analyze Maxwell's equation in different forms (Differential and integral) in Electrostatic, Magnetic time varying fields.
3. Ability to solve the problems in different EM fields.
4. Ability to analyze moving charges on Magnetic fields.
5. Ability to Solve Electromagnetic Relation using Maxwell Form

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(R18A0406) ANALOG CIRCUITS

OBJECTIVES:

The main objectives of the course are:

1. Study about Wave shaping concepts of both linear and non-linear circuits.
2. Study about the designing of multivibrators.
3. Study about Time Base Generator, understanding sampling gates and Logic Gates.
4. Analysis of basic transistor amplifier circuits and their frequency response characteristics, feedback amplifiers, oscillators, large signal amplifiers

UNIT -I:

BJT Amplifiers-Frequency Response: Frequency response of an amplifier, Analysis at low and High Frequencies, Hybrid-pi (π) common emitter transistor model, validity of hybrid- π model, variation of hybrid – π parameters, Millers theorem and its dual, the CE short circuit current gain, current gain with resistive load, gain-bandwidth product.

Multistage Amplifiers: Distortion in amplifiers, Analysis of cascaded BJT amplifier, Darlington pair, Coupling schemes-RC coupled amplifier, Transformer coupled amplifier, Direct coupled Amplifier.

UNIT -II:

FEEDBACK AMPLIFIERS: Concept of Feedback and types, Effects of negative feedback on amplifiers characteristics, voltage series, current series, current shunt, and voltage shunt feedback amplifiers.

OSCILLATORS: Classification of oscillators, Barkhausen criterion, RC phase shift oscillator, Wein-bridge oscillator, LC oscillators- Hartley and Colpitts oscillator.

UNIT III

LARGE SIGNAL AMPLIFIERS: Classification, Distortion in amplifiers, class A large signal amplifiers, efficiency of class A amplifier, class B power amplifier, efficiency of class B amplifier, class B push pull amplifier, Complementary symmetry class B push pull amplifiers, class AB push pull amplifier, Single Tuned Amplifier, Principles of Staggered Tuning**.**

UNIT IV

MULTIVIBRATORS: Transistor as a switch, switching times of a transistor. Analysis of Bistable, Monostable and Astable Multivibrators, Schmitt trigger using transistors.

UNIT -V

TIME BASE GENARATORS: General features of a Time Base Signal, Methods of Generating Time Base Wave forms, Basic Principles of Transistor Miller and Bootstrap Time Base Generator, Current Time Base Generator.

TEXT BOOKS:
1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
2. Integrated Electronics-Jacob Millman and Christos C. Halkias,1991 Ed -2008,TMH.

REFERENCE BOOKS:
1.Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2.Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman.
3.Microelectric Circuits-Sedra and Smith-5 Ed., 2009, Oxford University press.
4.Electronic Circuit Analysis-K.LalKishore, 2004, BSP.

OUTCOMES:
At the end of the course, the student will be able to;
1. Understand the concepts of wave shaping circuits
2. Design of multivibrators for various applications,
3. Understand the concepts of Time Base Generators
4. Analyzed the different types of amplifiers and oscillators

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(R18A0061) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

OBJECTIVES:

1. To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations that are needed for sound economic decision making.
2. The main purpose is to provide inputs on an overall analysis of an individual firm namely: demand and supply, production function, cost analysis, markets etc.
3. To understand and analyse the financial formats of the organisation for smooth running of the business.

UNIT-I

Introduction to Managerial Economics: Definition, Nature and scope of Managerial economics, Micro and Macroeconomic concepts.

Demand Analysis: Demand Determinants, Law of Demand and exceptions. Elasticity Of Demand: Definition, Types, Measurement and Significance of elasticity of Demand. Demand Forecasting, Factors governing demand Forecasting, methods of demand Forecasting.

UNIT-II

Production & Cost Analysis: Production Function- Isocost and Isoquants MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts. Break-Even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT-III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Objectives and Policies of Pricing- Methods of Pricing.

Business: Features of different forms of Business Organisation, Changing Business Environment in Post-liberalization scenario.

UNIT-IV

Introduction to Capital and Financial Accounting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance – Trading forecast, Capital Budget, Cash Budget.

Accounting Definition, Concepts and Conventions (GAAP); Formats for preparation of Trial Balance and Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet).

UNIT-V

Investment Decision: Features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios.

TEXTBOOKS:
1. Varsheney & Maheswari, Managerial Economics, Sultan Chand, 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, Hyderabad 2013
3. M. Kasi Reddy & Sarawathi, Managerial Economics and Financial Analysis, PHI, New Delhi, 2010.

REFERENCES:
1. S.N.Maheswari & S. K. Maheswari, Financial Accounting, Vikas, 2012.
2. D.N. Dwivedi, Managerial Economics, Vikas, 2012.
3. Justin Paul, Leena, Sebastian, Managerial Economics, Cengage, 2012
4. A,R.Aryasri: Managerial Economics and Financial Analysis, McGraw-Hill, 2011.

OUTCOMES:
Students should be able
1. To understand the basic economic principles, forecast demand and supply.
2. Should be able to estimate cost and understand market structure, pricing practices.
3. Able to interpret the financial results of the organisation.

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(R18A0282)ELECTRICAL MACHINES LAB – I

OBJECTIVES:
1.   To expose the students to the operation of DC Generator to expose the students to the operation of DC Motor.
2.   To examine the self excitation in DC generators.

The following experiments are required to be conducted compulsory experiments:
1.   Load test on DC shunt generator. Determination of characteristics.
2.   Load test on DC series generator. Determination of characteristics.
3.   Load test on DC compound generator. Determination of characteristics.
4.   Determination of critical resistance and critical speed of D.C. shunt generator
5.   Hopkinson's test on DC shunt machines. Predetermination of efficiency.
6.   Fields test on DC series machines. Determination of efficiency.
7.   Speed control of DC shunt motor
8.   Brake test on DC compound motor. Determination of performance curves.
9.   Retardation test on DC shunt motor. Determination of losses at rated speed.
10. Separation of losses in DC shunt motor

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(R18A0283)NETWORKS AND SIMULATION LAB

OBJECTIVES:
1. To design electrical systems.
2. To analyze a given network by applying various Network Theorems.
3. To measure three phase Active and Reactive power.
4. To understand the locus diagrams

PART-A: ELECTRICAL CIRCUITS
1. Average & RMS value of sinusoidal wave
2. Z and Y Parameters
3. Transmission and hybrid parameters
4. Locus Diagrams of RL and RC Series Circuits
5. Series and Parallel Resonance
6. Measurement of Active Power for Star and Delta connected balanced loads
7. Measurement of Reactive Power for Star and Delta connected balanced loads

PART-B: PSPICE SIMULATION
1) Simulation of DC Circuits
2) Mesh Analysis
3) Nodal Analysis
4) DC Transient response

Note: Any 6 Experiments from PART-A, PART-B Is Mandatory

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II Year B.Tech.EEE II Sem   L   T/P/D C

                                                                   2   -/-/- 0

MANDATORY COURSE – III
(R18A0014) ENVIRONMENTAL SCIENCES

OBJECTIVES:
1. To understand the importance of ecological balance for sustainable development
2. To understand the importance of Natural resources
3. To understand the impacts of developmental activities and mitigation measures for recognizing each and every action of us, reflects on the environment and vice versa.
4. To understand waste management

UNIT I

ENVIRONMENTAL EDUCATION AND ECOSYSTEMS   Environmental education: Definition and objective. Structure and function of an ecosystem, Food chain and Food Web, Ecological Pyramids, Bioaccumulation and Biomagnification.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on importance of Environmental Education

UNIT II

NATURAL RESOURCES   Introduction: definition, Forest resources- Uses, Causes and consequences of deforestation, Water resources- Sources and Uses of Water, Benefits and problems of DAMs, Energy resources-Renewable and Non-renewable energy resources.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Natural Resources

UNIT III

ENVIRONMENTAL POLLUTION   Environmental segments – structure and composition of atmosphere. Pollution – Sources, effects and control of Air, water. Climate change-ozone layer depletion, Global warming/greenhouse effect.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Environmental pollution.

UNIT IV

WASTE MANAGEMENT

Sources, effects and control of solid waste, bio medical waste - waste management and E-waste.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Cleanliness, segregation of waste and Swacha-Bharath.

UNIT V

Social Issues and the Environment

Concept, threats and strategies of sustainable development, Water conservation-rain water harvesting, Energy conservation, Green activities.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Social Issues and the Environment.

TEXT BOOKS:

1. Environmental Studies by Anubha Kaushik, 4th Edition, New age international Publishers.
2. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
3. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B.Botkin & Edward A.Keller, Wiley INDIA edition.
4. Principles of Environmental Science by William . P. Cunnningham & Mary Inn Cunnningham Tata McGRAW –Hill Publishing Company Ltd.
5. Environmental Studies by S. Rama Lakshmi & Purnima Smarath Kalyani Publishers.

OUTCOMES:

1. Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of Ecological principles and environmental regulations which in turn will help in sustainable development
2. This course will sensitise the students through activities assigned to them after every unit
3. This course will help the students understand the complex relationships between natural and human systems

OPEN ELECTIVES - 1

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech ECE-II Sem	L	T/P/D	C
	3	-/-/-	3

OPEN ELECTIVE - I
(R18A0451) DIGITAL ELECTRONICS

OBJECTIVES:
The main objectives of the course are:
1. To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions.
2. To introduce the methods for simplifying Boolean expressions.
3. To outline the formal procedures for the analysis and design of combinational and sequential circuits.
4. To introduce the concept of memories and programmable logic devices.
5. To illustrate the concept of synchronous and asynchronous sequential circuits.

UNIT I
BINARY SYSTEMS AND LOGIC GATES:
Binary Systems: The Advantage of Binary, Number Systems, The Use of Binary in Digital Systems,
AND, OR, NOT, NAND, NOR, Exclusive-OR, Exclusive-NOR and Exclusive-NAND implementations of Logic Functions using gates, NAND-NOR implementations.

UNIT II
MINIMIZATION TECHNIQUES:
Minimization Techniques: Boolean postulates and laws-De-Morgan's Theorem-Principle of Duality-Boolean expression-Minimization of Boolean expressions-Minterm-Maxterm-Sum of Products (SOP)-Product of Sums (POS)-Karnaugh map minimization-Don't care conditions-Quine Mc-Cluskey method of minimization.

UNIT III
COMBINATIONAL CIRCUITS:
Design Procedure-Half Adder-Full Adder-Half Subtractor-Full Subtractor-Parallel binary adder-Parallel Binary Subtractor-Multiplexer/ Demultiplexer-Decoder-Encoder.

UNIT IV
SEQUENTIAL CIRCUITS:
Latches, Flip-flops-SR, JK, D, T and Master-Slave-Characteristic table and equation-Application Table-Edge Triggering-Level Triggering-Realization of one flip-flop using other flip-flops-serial adder/subtractor-Asynchronous Counter-Asynchronous Up/Down Counter, Decade counter-Synchronous Counters-Synchronous Up/Down Counters, Decade Counters

UNIT V
MEMORY DEVICES:

Classification of Memories-ROM_ROM Organization, PROM-EPROM-EEPROM-EAPROM, RAM-RAM Organization-Write operation-Read Operation-Programmable Logic Devices-Programmable Logic Array (PLA), Programmable Array Logic (PAL)-Implementation of combinational logic circuits suing ROM, PLA, PAL.

TEXT BOOK:
1. M Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India PVt., Ltd., 2008/Pearson Education (Singapore) Pvt., Ltd., New Delhi, 2003.
2. Donald P Leach and Albert Paul Malvino, "Digital Principles and Applications", 6th Edition, TMH, 2006.

REFERENCES:
1. John F Wakerly. "Digital Design, Fourth Edition, Pearson/PHI, 2008
2. John M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2006
3. Charles H Roth, "Fundamentals of Logic Design", 6th Edition, Thomson Learning, 2013
4. Thomas L Floyd, "Digital Fundamentals", 10th Edition, Pearson Education Inc, 2011.
5. Donald D Givone, "Digital Principles and Design", TMH, 2003.

OUTCOMES:
After the completion of the course, the student will be able to:
1. Analyse different methods used for simplification of Boolean expressions
2. Design and implement Combinational and Sequential circuits.
3. Design and implement Synchronous and Asynchronous Sequential Circuits.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech ECE-II Sem   **L   T/P/D   C**

                                                                  3   -/-/-   3

OPEN ELECTIVE - I
(R18A0251) ELEMENTS OF ELECTRICAL ENGINEERING

OBJECTIVES:

1. To introduce the fundamental concepts of electromechanical energy conversion
2. To familiarize the students with the principle of operation, constructional features and operational characteristics of various types of Motors used in the engineering and consumer Industry

UNIT – I

Electromechanical Energy Conversion: Electromechanical Energy conversion – forces and torque in magnetic field systems – energy balance – energy and force in a singly excited magnetic field system, determination of magnetic force - co-energy – multi excited magnetic field systems.

UNIT – II

D.C. Generators & Motors :

D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings –– simplex and multiplex windings – use of laminated armature –   E. M.F Equation

D.C. Motors**:** Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. Speed control of DC Motors**:** Armature voltage and field flux control methods. Ward-Leonard system. – protective devices.

UNIT – III:

Single Phase Transformers:

Single phase transformers-principle of operation-constructional details- types-emf equation-equivalent circuit – operation on no load and on load-phasor diagrams –losses- minimization of hysteresis and eddy current losses-efficiency-all day efficiency-regulation-effect of variations of frequency and supply voltage on iron losses.

UNIT – IV:

Polyphase Induction Motors &Their Speed control

Polyphase induction motors:construction details of cage and wound rotor machines-production of a rotating magnetic field – principle of operation – rotor emf and rotor frequency –Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation – expressions for maximum torque and starting torque – torque slip characteristic – double cage and deep bar rotors

Speed control:change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation

UNIT – V:

Single Phase Motors & Special Machines: Single phase Motors: Single phase induction motor – Constructional features-Double revolving field theory Equivalent circuit - split-phase motors - Capacitor start Capacitor run motors. Principles of A.C. Series motor-Universal motor, Stepper motor shaded pole motor, Reluctance Motors, Brushless DC motors (Qualitative Treatment only).

TEXT BOOKS:
1. Electrical Machines, P.S. Bimbra, Khanna Publishers.
2. Principles of Electrical Machines, V. K. Mehta, Rohit Mehta, S. Chand Publishing.
3. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers.

REFERENCE BOOKS:
1. Electric Machines, Mulukutla S. Sarma, Mukesh K. Pathak, Cengage Learning.
2. Fundamentals of Electric Machines, B. R. Gupta, Vandana Singhal, New Age International Publishers.
3. Electric machinery – A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition.
4. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition

OUTCOMES:
At the end of the course the student will
1. Have a clear understanding of the materials used and features in the construction of the electrical machines like transformers, DC and AC motors and special purpose motors.
2. Acquire a basic knowledge on the principle of operation of all these machines
3. Have a basic knowledge on the Torque speed relations and the effect of load torque on their performance.
4. Will have fundamental concept on the speed control of the various types of motors.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech ECE-II Sem   L   T/P/D   C

                                             3   -/-/-   3

OPEN ELECTIVE - I

(R18A0551) DATABASE SYSTEMS

OBJECTIVES

1. To understand the basic concepts and the applications of database systems
2. To Master the basics of SQL and construct queries using SQL
3. To understand the relational database design principles
4. To become familiar with the basic issues of transaction processing and concurrency control
5. To become familiar with database storage structures and access techniques

UNIT I: INTRODUCTION

Data- Database: File Processing System Vs DBMS, History, Characteristic-Three schema Architecture of a database, Functional components of a DBMS.DBMS Languages-Database users and DBA.

UNIT II: DATABASE DESIGN

ER Model: Objects, Attributes and its Type. Entity set and Relationship set-Design Issues of ER model-Constraints. Keys-primary key, Super key, candidate keys. Introduction to relational model-Tabular, Representation of Various ER Schemas. ER Diagram Notations-Goals of ER Diagram- Weak Entity Set- Views.

UNIT III: STRUCTURED QUERY LANGUAGE

SQL: Overview, The Form of Basic SQL Query -UNION, INTERSECT, and EXCEPT– join operations: equi join and non equi join-Nested queries - correlated and uncorrelated-Aggregate Functions-Null values.

UNIT IV - DEPENDENCIES AND NORMAL FORMS

Importance of a good schema design,:- Problems encountered with bad schema designs, Motivation for normal forms- functional dependencies, -Armstrong's axioms for FD's-Closure of a set of FD's,- Minimal covers-Definitions of 1NF,2NF, 3NF and BCNF-Decompositions and desirable properties -

UNIT V:

Transactions: Transaction concept, transaction state, System log, Commit point, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, Testing for serializability**,** Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

TEXT BOOK:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," Database System Concepts", McGraw-Hill, 6th Edition , 2010.
2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.

REFERENCES:

1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management System", McGraw Hill., 3rd Edition 2007.
2. Elmasri&Navathe,"Fundamentals of Database System," Addison-Wesley Publishing, 5th Edition, 2008.
3. Date.C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition, 2006.
4. Peter rob, Carlos Coronel, "Database Systems – Design, Implementation, and Management", 9th Edition, Thomson Learning, 2009.

OUTCOMES:

1. Demonstrate the basic elements of a relational database management system
2. Ability to identify the data models for relevant problems
3. Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech ECE-II Sem   L   T/P/D   C

                                        3   -/-/-   3

OPEN ELECTIVE - I
(R18A0351) ELEMENTS OF MECHANICAL ENGINEERING

OBJECTIVES:

1. To give an insight to students about the behaviour of materials under external forces.
2. The concept of stress, strain, elasticity etc. as applied to various structures under loading are included.
3. The student able to learn about concept of fluids, turbines and engines.

UNIT - I

Stresses and strains: kinds of – stress-strains, elasticity and plasticity, Hooks law, stress – strain diagrams, modules of elasticity, Poisson's ratio, linear and volumetric strain, relation between E, N, and K, bars of uniform strength, compound bars and temperature stresses.

Shear force and bending moment: Types of supports – loads – Shear force and bending moment for cantilever and simply supported beams without overhanging for all types of loads.

UNIT - II

Theory of simple bending: simple bending formula, Distribution of Flexural and Shear stress in Beam section – Shear stress formula – Shear stress distribution for some standard sections.

Thin cylindrical shells: stress in cylindrical shells due to internal pressures, circumferential stress, longitudinal stress, design of thin cylindrical shells, spherical shells, change in dimension of the shell due to internal pressure, change in volume of the shell due to internal pressure

Thick Cylinders: Lame's equation- cylinders subjected to inside and outside pressures
Columns and Struts.

UNIT - III

Properties of Fluid : Stream line , streak line , path line , continuity equation   pipes are in series, pipes are in parallel, HGL, TGL , Bernoullis equation .

Hydraulic pumps and turbines: working principles and velocity diagrams.

UNIT - IV

Internal combustion engines: classification of IC engines, basic engine components and nomenclature, working principle of engines, Four strokes and two stroke petrol and diesel engines, comparison of CI and SI engines, comparison of four stroke and two stroke engines, simple problems such as indicated power, brake power, friction power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency.

UNIT - V

Belts - Ropes and chain: belt and rope drives, velocity ratio, slip, length of belt , open belt and cross belt drives, ratio of friction tensions, centrifugal tension in a belt, power transmitted by belts and ropes, initial tensions in the belt, simple problems.

Gear trains: classification of gears, gear trains velocity ratio, simple, compound –reverted and epicyclic gear trains.

TEXT BOOKS:

1. ”Strength of Materials and Mechanics of Structures”, B.C.Punmia, Standard Publications and distributions, 9 th ed.
2. Thermal Engineering, Ballaney,P.L., Khanna Publishers, 2003 .
3. Theory of Machines , S.S. Rattan , Tata McGraw Hill.
4. Fluid Mechanics and Hydraulic Machinery R.K. Bansal .

REFERENCE BOOKS:

1. Thermal Engineering, R.K. Rajput , Laxmi Publications .
2. Theory of Machines, R.S. Khurmi, S. Chand Publications.
3. Fluid Mechanics and Hydraulic Machinery, Modi & Seth.

OUTCOMES:

1. The student would be exposed to basic mechanical engineering machinery.
2. The student learned about mechanical components.
3. Student understand about engines and turbines .

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech ECE-II Sem   L   T/P/D   C

                                         3   -/-/-   3

OPEN ELECTIVE - I
(R18A0352) GREEN ENERGY SYSTEMS

OBJECTIVES:

1. The course aims to highlight the significance of alternative sources of energy.
2. Green energy systems and processes and provides the theory and working principles of probable sources of renewable and green energy systems that are environmental friendly.

UNIT-I

Introduction:

Solar Radiation: Role and potential of new and renewable sources, the solar energy option, Environmental impact of solar power, structure of the sun, the solar constant, sun-earth relationships, coordinate systems and coordinates of the sun, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data, numerical problems. Photo voltaic energy conversion – types of PV cells, I-V characteristics.

Solar Energy Collection: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT – II

Solar Energy Storage And Applications: Different methods, sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, solar cookers, central power tower concept and solar chimney.

Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, betz criteria, types of winds, wind data measurement.

UNIT – III

Bio-Mass: Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, bio fuels, I.C. engine operation and economic aspects.

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India.

Ocean Energy: OTEC, Principles of utilization, setting of OTEC plants,thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT –IV

Energy Efficient Systems: (A) Electrical Systems: Energy efficient motors, energy efficient lighting and control, selection of luminaire, variable voltage variable frequency drives (adjustable speed drives), controls for HVAC (heating, ventilation and air conditioning), demand site management.

(B) Mechanical Systems: Fuel cells- principle, thermodynamic aspects, selection of fuels & working of various types of fuel cells, Environmental friendly and Energy efficient compressors and pumps.

UNIT-V

Energy Efficient Processes: Environmental impact of the current manufacturing practices and systems, benefits of green manufacturing systems, selection of recyclable and environment friendly materials in manufacturing, design and implementation of efficient and sustainable green production systems with examples like environmental friendly machining, vegetable based cutting fluids, alternate casting and joining techniques, zero waste manufacturing.

Green Buildings: Definition, features and benefits. Sustainable site selection and planning of buildings for maximum comfort. Environmental friendly building materials like bamboo, timber, rammed earth, hollow blocks, lime & lime pozzolana cement, agro materials and industrial waste, Ferro cement and Ferro-concrete, alternate roofing systems, paints to reduce heat gain of the buildings. Energy management.

TEXT BOOKS:
1. Sukhatme S.P. and J.K.Nayak, Solar Energy – Principles of Thermal Collection and Storage, TMH.
2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.
3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

REFERENCES:
1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra.
2. Principles of Solar Energy / Frank Krieth & John F Kreider.
3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
4. Renewable Energy Technologies /Ramesh & Kumar /Narosa
5. Renewable Energy Technologies/ G.D Roy

OUTCOMES:
1. The student shall understand the principles and working of solar, wind, biomass, geo-thermal, ocean energies.
2. Green energy systems and appreciate their significance in view of their importance in the current scenario and their potential future applications.

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II Year B.Tech ECE-II Sem

L	T/P/D	C
3	-/-/-	3

OPEN ELECTIVE - I
(R18A0051) INTELLECTUAL PROPERTY RIGHTS

OBJECTIVES:

1. The objective of this course is to provide the knowledge on International IPR's and to make students efficient to take decisions in Global Corporate.

UNIT-I

Introduction: Intellectual property rights basics, the role and value of IP in international commerce, Issues affecting IP internationally. Agreement on trade related aspects of Intellectual Property Rights. (TRIPS) - Agreement on TRIPS and India.

UNIT-II

Parties to IP Rights: Owner, customer, authorized user, licensee, attorney, protection of the weak and strong, finalizing ownership and use rights.

UNIT-III

Ensuring the value of IP: Ensuring the value of IP at creation stage, after creation stage, precise contractual protection of IP rights. Key issues related to IP internationally. IP rights in international forums. Fundamentals in Country legal systems, generalities. Validity of IP rights locally: specifics.

UNIT-IV

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, work made for hire agreement - Protecting IP Rights: non disclosure agreement, cease and desist letter, settlement memorandum. Transferring IP Rights: assignment contract, license agreement, deed of assignment or license agreement, addendum to unrecorded assignment or license.

UNIT-V

Remedies and IPR Evaluation - GATT - WTO - Role of WTO in solving IPR issues.

TEXT BOOKS:

1. A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2nd Edition.
2. Intellectual Property Rights – Heritage, Science, & Society under international treaties – A. Subbian, - Deep & Deep Publications – New Delhi.
3. Intellectual Property Rights: N K Acharya: ISBN: 9381849309

REFERENCE BOOKS:

1. Intellectual Property Rights: C B Raju : ISBN-8183870341
2. Intellectual Property : Examples and Explanation – Stephen M McJohn, 2/e, ISBN-13: 978-0735556652
3. Intellectual Property Rights in the Global Economy – Keith E Maskus, PIIE, ISBN paper 0-88132-282-2

OUTCOMES:

1. It allows students how to prepare and protect the Inventions , start up ideas and rights of patents and copy rights etc.,
2. This subject brings awareness to the students the basic legal aspects at present following at Global level.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   ENGLISH (R18A0001)   Max Marks: 70
BRANCH: B.TECH I - I (Common to all Branches)

This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO : 1 a) Do you think, in the poem 'The Road not Taken', the speaker regrets his choice, or is happy about it? Why?   [7M]
   b) Correct the following sentences.   [7M]
      i) I (learn) ------- English for seven years now.
      ii) But last year I (not / work) ---------- hard enough for English, that's why my marks (not / be) --------- really that good then.
      iii) During my last summer holidays, my parents (send) --------- me on a language course to London.
      iv)There I (notice) -------- how important it (be) --------- to speak foreign languages nowadays.
      v) And after my apprenticeship, maybe I (go) ---------- back to London to work there for a while.

OR

Q.NO: 2 a) Write a paragraph on the any **one** of the following.
      i) Importance of success. ii) Best moment in your life.   [7M]
   b) Punctuate the following sentences.   [4M]
      i.   We had a great time in france the kids really enjoyed it
      ii. Some people work best in the mornings others do better in the evenings
      iii. What are you doing next weekend
      iv. Mother had to go into hospital she had heart problems
   c) What are affixes? Explain with one example.   [3M]

SECTION-II

Q.NO: 3 a) What does Abraham say to his Son's teacher to explain him?   [7M]
   b) Do as directed.   [7M]
   i) John collects money. (passive voice)
   ii) Anna opened the window. -(passive voice)
   iii) William will not repair the car. -(passive voice)
   i v) We are taught grammar by Ms Sullivan. (active voice)
   v) He was praised by the teacher. (active voice)
   vi) The teacher was pleased with the boy's work. (active voice)

OR

Q.NO: 4 a) Write a letter to the principal requesting him to grant you one week leave for your sister's wedding. [7M]

b) Lodge a complaint to the lgcompany@gmail.com about the malfunctioning of newly bought refrigerator. [4M]

c) What are transitive and intransitive verbs. Give examples. [3M]

SECTION-III

Q.NO: 5 a) Write the summary of the lesson 'War' along with a brief introduction to the author. [8M]

b) Do as directed. [6M]

i) Very few students in the school are so talented as Mary (comparative)

ii) Jacob is richer than most other business icons in the group. (positive)

iii) No other boy in his class is so tall as he. (superlative)

OR

Q.NO: 6 a) Write an essay on " Improtance of holidays" [7M]

b) Use appropriate prepositions for the following. [3M]

i) This material is different ………………… that. (from / to / with)

ii) You should explain this ………………… them. (to / at / with)

iii) I haven't been to the theatre ………………… a long time. (since / for /from)

c) Complete the phrasal verbs according to their meanings in brackets. [4M]

(look after , Take off, try on, find out)

i) ---------your shoes. (Remove)

ii) Somebody has to --------- the baby. (Take care of)

iii) She wants to -------- the truth? (Discover)

iv) Where can I -------- true !". the sweater? (See if it fits)

SECTION-IV

Q.NO: 7 a) What are the benefits of imagination according to J.K Rowling's experience? [7M]

b) Choose the correct article: a, an, the or x (no article) [7M]

i. Are you coming to ------ party next Saturday?

ii. I bought -------- new TV set yesterday.

iii. I think -------- man over there is very ill. He can't stand on his feet.

iv. I watched --------- video you had sent me.

v. She was wearing -------- ugly dress when she met him.

vi. I am crazy about reading ----------- history books.

vii. She is -------- nice girl.

OR

Q.NO: 8 a) What are the rules of making a précis? [3M]

b) Give one word substitute for the following. [4M]

i) Hard to please

ii) One who is the first to think about something.

iii) A person who never drinks.

v) Belief in many Gods

c) How failure is a stepping stone to success according to J. K. Rowling?   [7M]

SECTION-V

Q.NO: 9 a) Write a memo to your company staff. Ensure that your message is clear, concise, courteous and complete. Include in your memo: [8M]

1. The importance of being punctual

2. Some recommendations on how they can be punctual.

b) Choose the correct word to fill in the blank.   [6M]

i) Justin was _____ for the big exam when he discovered it had been cancelled.

all ready / already

ii) It was _____ seven o'clock by the time we reached Boston.

all ready/ already

iii) As a waitress, I was only allowed one fifteen-minute _____.

Brake / break

iv) I'm afraid the _____ in this car aren't very reliable.

Brakes / breaks

v) The English _____ I took last semester was the best I've ever taken.

Course / coarse

vi) This pattern works best with _____, heavy fabric.

Course / coarse

OR

Q.NO: 10   a) Fill in the blanks with correct pronoun.   [7M]

i)   All of the jewels have lost _____ glow.

ii) The jury read _____ verdict.

iii) The family members disagreed among _____

iv) He delivered _____ inaugural address at 9:00 AM

v)   Matthew hopes that someone will give _____ a Lego set for his birthday

vi) Anyone can do this if _____ tries.

vii) I hurt _____.

b) Fill in the blanks with correct verb. [7M]

    i. The student or the committee members _____ every day.

    ii. A lot of money _____ donated to the charity every year.

    iii. Her shorts _____ very comfortable.

    iv. The committee _____ in various volunteer activities in their private lives.

    v. Strategies that the teacher _____ to encourage classroom participation include using small groups and clarifying expectations.

    vi. Neither the plates nor the serving bowl _____ on that shelf.

    vii. She, my friends, and I _____ not going to the festival.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   ENGLISH (R18A0001)   Max Marks: 70
BRANCH: B.TECH I - I (Common to all Branches)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks. Each question may or may not have a, b, c as sub questions.

SECTION-I
Q. No. 1 a) Critically analyze the poem, "The Road Not Taken".   [5M]
      b) Write a paragraph on the recipe for success.   [5M]
      c) Given below are few words which must be made into a noun, adverbs and
         adjective using suffixes.
       i. to be brave   ii. Childiii. Spect   iv. Create   [4M]
OR
Q. No. 2 a) Is the title "The Road Not Taken" apt. Suggest another title and justify its
         relevance.   [9M]
      b) Using the verb in the correct tense, fill in the blanks   [5M]
   i.   Do you know Priya and Sameer _____ next month (marry)
   ii. He _____ situations well. (handle)
   iii. The writer _____ to pass his strong beliefs to the students. (try – past
        tense)
   iv. By the time you call Ramya tonight, she _____ a message from Ratna.
        (receive)
   v.   I _____ my breakfast just now. (take)

SECTION-II
Q. No. 3 a) What made Lincoln write such a letter to his son's teacher.   [7M]
      b) Change the voice of the sentences: [7M]
            i. advertise the post.
            ii. Ram gave flowers to Vaishnavi
            ii. The courier has been sent by him.
            iv. Somebody cooks meal every day.
            v. the master punished the servant.
            vi. She paid a lot of money.
            vii. Does the police officer catch the thief?

OR
Q. No. 4 *a) "Teach him to sell his talents and brains to the highest bidder but never to put a
         price tag on his heart and soul."* Elaborate this in the light of "Abraham Lincoln
         letter to his son's teacher."   *[4M]*

b) Label the underlined word as non-finite, transitive, intransitive or ergative: [5M]

    i.   At the age of 6 months, teeth <u>grow.</u>
    ii. A gentleman <u>opens</u> the door for a lady.
    iii. He loves <u>to read</u> in the library.
    iv. He <u>slept</u>.
    v. He <u>kept </u>the book under the table.

c) Write an email to customer care of Amazon complaining about a recent purchase and your dissatisfaction with the product and the service. [5M]

SECTION-III

Q. No. 5 a) In "War" by Pirandello, five characters are travelling in the second train carriage. Write the character sketches of any two characters. [6M]

b) Write the meanings of the words and make sentences of your own using the words: [4M]

   i. Accelerate   ii. Spectacle   iii. sluggish   iv. Myriad

c) Write an essay on "A model student" [4M]

OR

Q. No.6 a) Write the meanings of the following phrasal verbs and make sentences of your Own [7M]

    i.   Give in
    ii.   Ask around
    iii.   Break down
    iv.   Drop out
    v.   Figure out
    vi.   Get away
    vii. Hand in

b) Fill in the following blanks with a suitable preposition: [7M]

i. Rohit has a taste _____ music.
ii. She is not familiar _____ her tricks.
iii. Akanksha has an initiation _____ lunch.
iv. Helen is a disgrace _____ her family.
v. her mother has no control _____ her.
vi. Venu is fit _____ that job. He can row _____ the lake.
vii. The first victim gave evidence against him.

SECTION-IV

Q. No. 7 a) From Rowling's speech, explain how failure is beneficial? [7M]

b) c) Use article(s) if necessary. [5M]

    i.   _____ doctors say that _____ apple a day keeps _____ away.
    ii.   He has _____ MBA from Osmania University.
    iii. Cyclops is _____ eyed man.

c) Substitute these phrases with one-word each: [2M]

   i. One who does not believe in God

   ii. One who hates women.

OR

Q. No. 8 a) Write a précis for the paragraph below (in 50 words) and suggest a suitable title.

[9M]

We all know what we mean by a "good" man. The ideally good man does not drink or smoke, avoids bad language, converses in the presence of men only exactly as he would if there were ladies present, attends church regularly and holds the correct opinion on all subjects. He has a wholesome horror of wrong-doing and realizes that it is our painful duty to castigate sin. He has a still greater horror of wrong thinking, and considers it the business of the authorities to safeguard the young against those who question the wisdom of the views generally accepted by middle-aged successful citizens. Apart from his professional duties, at which he is assiduous, he spends much time in good works: he may encourage patriotism and military training; he may promote industry, sobriety and virtue among wage earners and their children by seeing to it that failures in these respects receive due punishment; he may be a trustee of a university and prevent an ill-judged respect for learning from allowing the employment of professors with subversive ideas. Above all, of course, his "morals" in the narrow sense must be irreproachable.

b) Label the underlined word as transitive or intransitive : [5M]
   i.   Jack can hear Jill when she whispers clearly.
   ii.   He only eats ice-cream.
   iii. Having read your letter, my dog will be taken to the vet for a test.
   iv. Walking down the street, the sky was a brilliant blue.
   v.   To complete the survey properly, the form must be signed and sealed in the provided envelope.

SECTION-V

Q. No. 9 a) b) Fill in the blanks with the appropriate words from the two in brackets: [5M]
   i.   Neither she nor I _____ ready for the party.(are/is)
   ii.   Always wait until *every student* _____ attentive. (are/is)
   iii. The boys _____ been talking to the sportsperson. (have/has)
   iv. Oranges or banana _____ rich in vitamin C.(are/is)
   v.   The car with many riders _____ speeding round the curve. (are/is)

b) Fill in the sentences with the appropriate words from the two in brackets: [5M]
   i. Our _____ have always advised us to keep our culture alive. (forbear, forebear)
   ii. You are _____ (fair, fare)
   iii. _____ your smile, I like the way you interact with others. (Beside, besides)

iv. That merit student was given a fee _____(waiver, waver)
v. Yesterday I went with my son to buy _____ (stationary, stationary)

c) Fill in the blanks with an appropriate pronoun: [4M]

i. Ariel is usually optimistic, but _____is very upset today.
ii. When _____ arrived in Los Angeles, the Smiths had trouble clearing customs, so they were at the airport for four hours.
iii. Reginald wanted to try throwing the ball _____
iv. Example: The kitten is huge for _____rage.

OR

Q. No. 10 a) You are the Head of the department of a college. You have been informed that a certain student often arrives late for class. Write a memo addressing the problem. [6M]
✓ Saying how often the student arrives late
✓ Describing the effect on other student
✓ Suggesting what the student should do about the situation.
b) What are the techniques of reading? Elucidate [8M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   ENGLISH (R18A0001)   Max Marks: 70

BRANCH: B.TECH I - I (Common to all Branches)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks. Each question may or may not have a, b, c as sub questions.

SECTION-I

Q. No. 1 a) Why does the poet Robert Frost say, "I shall tell people this with a sigh"?   [6M]

    b) Fill in the blanks with correct tense.   [6M]

i) I (not/work) _____ hard enough for English, that's why my marks got
   increased   [4M]
ii) It (be) _____ great and I (think) _____ I (learn) _____ a lot.

    c) Use a prefix or a suffix to make a new word out of the word in brackets.   [4 M]
   i) Don't stand near the water. It's too _____(danger)

   ii) If you have a haircut it will change your _____ (appear)

   iii)I can't answer this question. It's _____ (possible)

   iv)When you _____ (write) this paragraph, make it a bit shorter.

Q. No. 2 a) Does the poem "The Road Not Taken" contain only one theme?   [5M]
       b) Use appropriate punctuation marks in the following sentences   [5M]

      i)   We had a great time in France the kids really enjoyed it
      ii)   Some people work best in the mornings others do better in the evenings
      iii)   What are you doing next weekend
      iv)   Mother had to go into hospital she had heart problems
      v)   Did you understand why I was upset
    c) Write a paragraph on, "a day I will always remember".   [4M]

SECTION – II

Q. No. 3 a) What are the major skills that Lincoln wanted his son to possess?   [5M]
    b) Change the voice of the following sentences.
      i)   The spectators thronged the streets.
      ii)   Bicycle has been sold by me.
      iii) He will finish the work in the fortnight.
      iv)   Admittance was refused to him by the guide.
    c) Write an email to your principal seeking permission to raise funds in the college for
      the welfare of the flood victims.   [5M]

OR

Q. No. 4 a) Why is it essential for someone to have "sublime faith in mankind"?   [5M]

   b) Underline the verb and state whether its transitive or intransitive   [5M]

   i)   You must speak loudly.
   ii) We clean our room everyday
   iii) Those people painted their house blue.
   iv) I like her

   c) Write a letter to your class teacher requesting to grant five days leave due to health issues.   [5M]

SECTION III

Q. No. 5 a) Bring out the patriotism of the parents from the lesson "war"?   [5M]

   b) Write an essay on "ban on mobile phone in colleges".   [7M]

   c) Complete the following sentences using the appropriate form of the adjective.

   i) Supriya is the …………………… girl in the class.(intelligent/more intelligent/most intelligent)
   ii) China is a ……………….. country. (big/bigger/biggest)   **[2M]**

OR

Q. No. 5 a) According to you, What is important - love for family or love for country ? [5M]

   b) Fill in the blanks with appropriate preposition.   [5M]
   i.   This material is different ………………… that. (from / to / with)
   ii. You should explain this ………………… them. (to / at / with)
   iii. He has been absent ………………… Monday. (since /for / from)
   iv. I haven't been to the theatre ………………… a long time. (since / for /from)
   v.   He goes ………………. school by car. (to / at / on)

   c) Fill in the blanks with apt phrasal verb.   [4M]

   i. Quick! _____ the bus. It's ready to leave.
   ii. It's dark inside. Can you _____ the light, please?
   iii. It's so loud here. Can you _____ the radio a little.
   iv. Does your little brother _____ ghosts?

SECTION IV

Q. No. 7 a) According to Rowling, why 'Imagination' is crucial in one's life?   [4M]

   b) Fill in the article A, An or The where necessary. Tick X where no articles used. [7M]
   i.   Mary has ____ terrible headache.
   ii. What do you usually have for _____ breakfast?

iii. Do you still in _____ Canada?
iv. I read ____ story yesterday.
v. My brother doesn't eat _____ chicken.
vi. Vic can play ____ jazz.
vii. _____ night is quite. Let's take a walk.

c) Fill up the blanks with appropriate one word substitute.   [3M]

i. A person of good understanding knowledge and reasoning power.
ii. The study of ancient societies.
iii. That which cannot be corrected.

OR

Q. No. 8 a) How does J.K.Rowling want the Harvard graduates to make the use of their 'status' to influence the world?   [5M]

b) Rewrite each sentence, moving the misplaced modifier to its correct position.   [4M]

i) The bus station was located by a river which was made of red brick.
ii) The results will only be known after all the votes have been counted.
iii) The contractors needed all kinds of artists to paint the mural badly.
iv) Left alone in the house, the thunderstorm terrified the two small children.
v) Sam asked me to go for a ride on the telephone.

c) Write a précis of the following reducing each of them to one third of the length.[5M]

Men and women are of equal rank but they are not identical. They are be peerless pair being supplementary to one another, each helps the other so that without one the existence of the other cannot be conceived and, therefore it follows as a necessary corollary from these facts that anything that will impair the status of either of them will involve the equal ruin of them both. In framing any scheme of women's education this cardinal truth must be constantly kept in mind. Man is supreme in the outward activities of a married air and therefore it is in the fitness of things that he should have a greater knowledge thereof. On the other hand, noise life is entirely the sphere of woman and, therefore in domestic affairs, in the upbringing and education of children, woman ought to have more knowledge Not that knowledge should be divided into water tight compartment's or that so that some branches of knowledge should be closed to anyone, but unless courses of instruction are based on discriminating appreciation of these basic principles, the fullest life of man and woman cannot be developed. Among the manifold misfortunes that may befall humanity, the loss of health is one of the severest. All the joys which life can give cannot outweigh the sufferings of the sick. Among the manifold misfortunes that may befall humanity, the loss of health is one of the severest. All the joys which life can give cannot outweigh the sufferings of the sick.

SECTION V

Q. No. 9 a) As a boss of an organization write a memo to your employees about their poor

time management and professional behaviour within the organization.   [7M]

b) Complete the given sentences putting the words, phrases and clauses given in
   brackets, in the right order.   [7M]
   i.   …………….. is called Bodh Gaya. (place, where the Buddha got enlightenment, the)
   ii. …………….. will have to pay a fine. (who do not return the library books by the due
        date, boys, those)
   iii. …………….. is a Member of Parliament. (who has just spoken, man, the)
   iv. …………….. move around the sun. (planets, which belong to the solar system, all,
        the)
   v.   …………….. is for a school. (new, which the villagers have built, this, building)
   vi. …………….. never returned empty-handed. (men, who went to the Raja for help)
   vii. ……………… woke up everybody in the neighborhood. (loud, the, of the sudden
        explosion, noise)

OR

Q. No. 10 a) Choose the correct word.   [7M]
   i.   I am _____ by the images I see on TV. (effect, affect)
   ii. Justin has _____ of problems. (alot, a lot)
   iii. What is your _____reason for moving to Chicago? (principal, principle)
   iv. _____hiding in your closet? (Whose, Who's)
   v.   Last year Becky (lead, led) the league in goals.
   vi. Computers are being called on to perform many new functions, including the
        consumption of homework (formally, formerly) eaten by the dog.
   vii. The handle was (lose, loose) and could (have, of) fallen off at any moment

   .   b) Correct the following subject verb agreement sentences.   [7M]
       Neither he nor she are ready to solve the problem.

       i)   Raghu did not brought a book to the class.
       ii)   Everyone in the ground are playing cricket.
       iii) The boy with lot of books look great.
       iv)   Virat want to go home now..
       v)   The brothers as well as their sister is good at their studies.
       vi)   The students accompanied by their teacher has gone on a picnic

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   MATHEMATICS-I (R18A0021)   Max Marks: 70
BRANCH: B.TECH I - I (Common to all Branches)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q.NO: 1 a) Define Rank of a Matrix. Find the rank of the matrix A = $\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & -4 \\ 2 & 3 & 5 & -5 \\ 3 & -4 & -5 & 8 \end{bmatrix}$ by reducing

into canonical form or normal form.   [7M]

b) Discuss for what values of λ, μ the simultaneous equations x + y + z = 6, x+2y+3z =10, x+2y+λz = μ have (i). No solution (ii). A unique solution (iii). An infinite number of solutions   [7M]
OR
Q.NO: 2 a) Find the Eigen values and Eigen vectors of the matrix is $\begin{bmatrix} 3 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ [14M]

SECTION-II

Q.NO: 3 a) If x + y + z = u, y + z = uv, z = uvw then evaluate $\dfrac{\partial(x, y, z)}{\partial(u, v, w)}$.   [7M]

b) Expand $x^2 y + 3y - 2$ in powers of $(x - 1)$ and $(y + 2)$ using taylor's theorem. [7M]

OR
Q.NO: 4 a) The Find the stationary points of u(x, y) = sin x siny.sin(x+y) where $0 < x < \pi; 0 < y < \pi$ and find the maximum.   [7M]

b) Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid $x^2/a^2 + y^2/b^2 + z^2/c^2 = 1$.   [7M]

SECTION-III

Q.NO: 5 a) A pot of boiling water 100^0 C is removed from the fire and allowed to cool at 30^0 C room temperature. Two minutes later, the temperature of the water in the pot is 90^0 C. What will be the temperature of water after 5 minutes?   [7M]

b) Solve $(D^2 - 2D + 1) y = x^2 e^{3x} - \sin 2x + 3$.   [7M]

OR
Q.NO: 6 a) The number N of bacteria in a culture grew at a rate proportional to N . The value of N initially was 100 and increased to 332 in one hour. What was the value of N after $1\dfrac{1}{2}$

hours?

b)Solve $(D^2 + a)y = \tan ax$, by the method of variation of parameters. [7M]

SECTION-IV

Q.NO: 7 a) Solve the partial differential equation $p\sqrt{x} + q\sqrt{y} = \sqrt{z}$ [4M]

b) Solve $z(p^2-q^2) = x - y$ [4M]

c) Solve by the method of separation of variables $2xz_x - 3yz_y = 0$ [6M]

OR

Q.NO: 8 a) Solve z^2 = pqxy by charpit's method [7M]

b) Solve $p^2+q^2 = x^2+y^2$ [7M]

SECTION-V

Q.NO: 9 a) Find inverse Laplace transform of $\frac{5s-2}{s^2(s+2)(s-1)}$ [4M]

b) Find $L\{\int_0^t te^{-t} \sin4t\,dt\}$ [6M]

c) Find the inverse Laplace transform of $\frac{e^{-\pi(s+2)}}{s+2}$ [4M]

OR

Q.NO: 10 a) Find the Laplace transform of e^{3t} - $2e^{-2t}$ + sin2t + cos3t + sinht - 2cosh3t + 8 [4M]

b) Using Laplace transform, evaluate $\int_0^\infty te^{-t} \sin t\,dt$ [4M]

c) State and prove Convolution theorem? [6M]
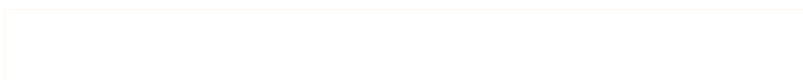
Time: 3 hours   **MATHEMATICS-I (R18A0021)**   **Max Marks: 70**

BRANCH: B.TECH I - I (Common to all Branches)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q. No.1 State Cayley-Hamilton theorem and find the Characterstic polynomial of the matrix

$A = \begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ verify Cayley-Hamilton theorem and hence find A^{-1} [14M]

OR

Q. No. 2 a) Define Rank of a matrix   [2M]

b) Diagonalize the matrix $A = \begin{bmatrix} 2 & 2 & -7 \\ 2 & 1 & 2 \\ 0 & 1 & -3 \end{bmatrix}$ and hence find A^4.   [12M]

SECTION-II

Q. No. 3 a) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction.   [7M]

b) Determine whether the function $u = x\sqrt{(1-y^2)} + y\sqrt{(1-x^2)}, v = \sin^{-1}x + \sin^{-1}y$ is functionally dependent if so find the relation.   [7M]

OR

Q. No. 4 a) Expand $e^x \cos y$ near $(1, \frac{\pi}{4})$ using Taylor's theorem   [4M]

b) If $x = e^r \sec\theta, y = e^r \tan\theta$ prove that $\dfrac{\partial(x,y)}{\partial(r,\theta)} \cdot \dfrac{\partial(r,\theta)}{\partial(x,y)} = 1$

[10M]

SECTION-III

Q. No. 5 a) Solve $\left(1 + e^{\frac{x}{y}}\right)dx + e^{\frac{x}{y}}\left(1 - \dfrac{x}{y}\right)dy = 0$

[7M]

b) Solve $(D^2 + a^2)y = \tan ax$ by the method of variation of parameters   [7M]

OR

Q. No.6 Solve $(D^2+1) x = t \cos 2t$ given $x = 0$, $\frac{dx}{dt} = 0$ at t = 0   [14M]

SECTION-IV

Q. No. 7) a) Solve the partial differential equation $\frac{p}{x^2} + \frac{q}{y^2} = z$ [7M]

b) Solve the partial differential equation $\frac{x^2}{p} + \frac{y^2}{q} = z$ [7M]

OR

Q. No. 8. Solve the equation $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, $u(x, 0) = 6e^{-3x}$ by the method of separation of variables

[14M]

SECTION-V

Q. No. 9 a) Evaluate $i)$ $\int_0^\infty t e^t \sin t \, dt = \frac{3}{50}$ [7M]

b) Using Convolution theorem ,Evaluate $L^{-1}\left\{\frac{s}{(s+2)(s^2+9)}\right\}$ [7M]

OR

10. a) Find the laplace transform of $\frac{e^{-at} - e^{-bt}}{t}$ [4M]

b) Solve $y'' + 2\,y' - 3y = \sin t$ using laplace transform given that $y = \frac{dy}{dt} = 0$ when $t = 0$ [10M]
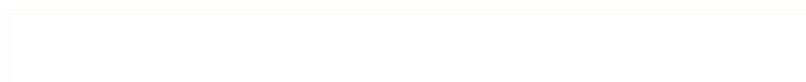
Time: 3 hours   **MATHEMATICS-I (R18A0021)**   **Max Marks: 70**

BRANCH: B.TECH I - I (Common to all Branches)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q.No. 1 a) Define Rank of a Matrix.   [2M]

b) Reduce the matrix A to normal form where $A = \begin{bmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{bmatrix}$,hence find the rank.

[6M]

c)Find the values of p & q so that the equations 2x+3y+5z=9,7x+3y+2z=8,2x+3y+pz=q has
i)No solution ii)Unique solution iii)An infinite number of solutions.   [6M]

OR

Q.No. 2 a) Find the Characterstic polynomial of the matrix $A = \begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ verify Cayley-

Hamilton theorem and hence find A^{-1} and A^4 [14M]

SECTION-II

Q.No. 3 a) Prove that u = $\frac{x^2 - y^2}{x^2 + y^2}$, v = $\frac{2xy}{x^2 + y^2}$ are functionally dependent and find the relation between

them.   [7M]

b) Find the minimum value of $x^2 + y^2 + z^2$, given that xyz = a^3 [7M]

OR

Q.No. 4 a) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction.   [7M]
b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is a cube.   [7M]
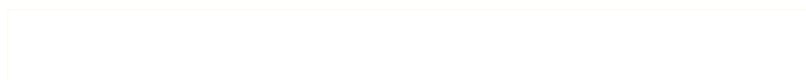
SECTION-III

Q.No. 5 a) Solve $\frac{d^2y}{dx^2} + y = x \sin x$ by the method of variation of parameters [10M]

b) Solve $\frac{d^4y}{dx^4} - y = 0$ [4M]

OR

Q.No. 6 a) Solve the differential equation $y(xy + e^x)dx - e^y dy = 0$. [6M]

b. Solve $(D^2 + 4)y = e^x + \sin x$ [8M]

SECTION-IV

Q.No. 7 Solve px+qy = pq using charpit's method [14M]

OR

Q.No. 8 a) Solve $x^2 p^2 + xpq = z^2$ [6M]

b) Using the method of separation of variables solve $4\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 3u$ given $u = 3e^{-y} - e^{-5y}$

where x=0. [8M]

SECTION-V

Q.No. 9 a) Find $L^{-1}\left\{\log\left(\frac{s+3}{s+2}\right)\right\}$

[4M]

)Using the convolution theorem find $L^{-1}\left\{\frac{s}{\left(s^2 + a^2\right)^2}\right\}$

[10M]

OR

Q. No. 10 Solve by Laplace transform

$\frac{d^3y}{dt^3} + 2\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 0$, $y(0) = 1$, $y'(0) = y''(0) = 2$ [14M]
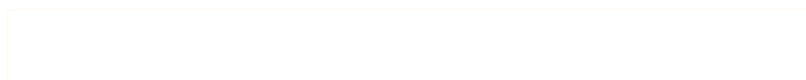
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   APPLIED PHYSICS (R18A0013)   Max Marks: 70
BRANCH: B.TECH I - I (ECE,CSE,EEE,IT)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I
Q.NO: 1 a) Show that the energy levels in 1D potential box are discrete.   [10 M]
   b) Explain matter waves.   [4M]
OR
Q NO: 2 a) Explain the Davisson and Germer's experiment that verifies the wave nature of
      light.   [10M]
   b) An electron is moving under a potential field of 15 kV. Calculate the wavelength
      of electron waves.   [4M]

SECTION-II
Q.NO: 3 a) Write a short notes an Brillouine zones   [4M]
   b) Define and derive the expression for effective mass of an electron.   [10M]
OR
Q.NO: 4 a) Derive an expression for density of energy states.   [8M]
   b) Explain the classification of material based on the energy bands   [6M]

SECTION-III
Q.NO: 5 Derive an expression for concentration of electrons in intrinsic semiconductor.[14M]
OR
Q.NO: 6 a) Define hall effect and derive an expression for hall coefficient for P – type
      Semiconductor.   [8M]
   b) Explain construction and working of solar cell.   [6M]

SECTION-IV
Q.NO: 7 a) Derive an expression for electronic and ionic polarization of dielectric material.[8M]
   b) Derive the Classius –Mossotti relation.   [6M]
OR
Q.NO: 8 a) Derive an expression for Bhor magneton.   [6M]
   b) Explain Hysteresis loop on domain theory.   [8M]

SECTION-V
Q.NO: 9 a)   Explain the construction and working principle of He - Ne laser with neat
      diagram.   [8M]
   b) Write the applications of laser.   [6M]
OR
Q.NO: 10 a) Derive the expression for numerical aperture and acceptance angle.   10M]
   b) Write the applications of an optical fiber.   [4M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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UG Model question paper
Time: 3 hours   APPLIED PHYSICS (R18A0013)   Max Marks: 70
BRANCH: B.TECH I - I (ECE,CSE,EEE,IT)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q.NO: 1 a) Derive the time independent Schrödinger's wave equation.   [10M]
     b) Write short notes on Heisenberg's uncertainty principle   [4M]

OR

Q.NO: 2 a) Show that the wavelength λ associated with a electron of mass m is given by

$$\lambda = \frac{h}{\sqrt{2mE}}$$ [10 M]

     b) Calculate the wavelength of an electron associated with energy of 2000 eV. [4M]

SECTION-II

Q.NO: 3 Show that the Kronig Penny model leads to energy band structure in solids. [14M]

OR

Q.NO: 4 a) Derive an expression for density of states.   [10M]
     b) Explain E – K diagram.   [4M]

SECTION-III

Q.NO: 5 a) Derive an expression for concentration of electrons in n type semiconductor. [8M]
     b) Distinguish direct and indirect band gap semiconductors   [6M]

OR

Q.NO: 6 a) Define Hall Effect and derive an expression for hall coefficient?   [10M]
     b) The hall coefficient of a specimen is 7.35 ×10^{-5} m^3/cm, then find the nature of semiconductor and concentration of charge carriers.   [4M]

SECTION-IV

Q.NO: 7 Derive an expression for internal field in a dielectric material with neat diagram.[14M]

OR

Q.NO: 8 a) Differentiate dia, para and ferro magnetic materials on the basis of magnetic moment.   [8M]
     b) Explain soft and hard magnetic materials.   [6M]

SECTION-V

Q.NO: 9 a) Derive the relation between Einstein's coefficients   [8M]
     b) Write short notes on population inversion   [6M]

OR

Q.NO: 10 a) Define and derive the expression for numerical aperture and acceptance angle.   [10M]

     b) For an optical fiber the refractive indices of core and cladding are 1.50 and 1.41 then determine numerical aperture and acceptance angle of the optical fiber assuming that light is launched into optical fiber from air medium.   [4M]
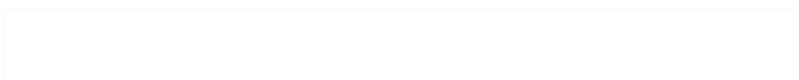
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   APPLIED PHYSICS (R18A0013)   Max Marks: 70
BRANCH: B.TECH I - I (ECE,CSE,EEE,IT)
Note: This question paper contains of 5 sections. Answer five questions, choosing one
question from each section and each question carries 14 marks.

SECTION-I
Q.NO: 1 a) Derive Schrodinger time independent wave equation?   [9M]
   b) Write the physical significance of wave function   [5M]
                              OR
Q.NO: 2 a) Explain the G.P. Thomson experiment that verifies the wave nature of light. [10M]
      b) An electron is moving under a potential field of 15 kV. Calculate the wavelength of
      electron waves.   [4M]
SECTION-II
Q.NO: 3 a) Explain Bloch's theorem with neat diagram.   [6M]
   b) Derive an expression for density of states.   [8M]
                              OR
Q.NO: 4 a) Explain the effect of temperature on Fermi level with neat diagram.   [8M]
      b) Explain the classification of solid in terms of metals, semiconductors   [6M]
      insulators.
SECTION-III
Q.NO: 5 a) Calculate the carrier concentration in P-Type semiconductor?   [9M]
      b) Derive an expression for Fermi energy in intrinsic semi conductor.   [5M]
                              OR
Q.NO: 6 a) Define Hall Effect and derive an expression for hall coefficient for P – type
      semiconductor.   [8M]
   b) Explain construction and working of LED.   [6M]
SECTION-IV
Q.NO: 7 a) What is internal field and Derive an expression for calculation of internal field in
      dielectric material?   [10M]
      b) Find the electric susceptibility of a dielectric gas having dielectric constant of
      1.41
                              OR
Q.NO: 8 a) Explain properties of anti ferro and ferri magnetic materials.   [7M]
   b) Differentiate hard and soft magnetic material.   [7M]
SECTION-V
Q.NO: 9 a) Define the terms i. Stimulated emission ii. Population Inversion
                     iii. Meta stable state   iv. Pumping   [4 M]
      b) Explain the construction and working of Ruby laser with the help of energy
      level diagram?   [10M]
                              OR
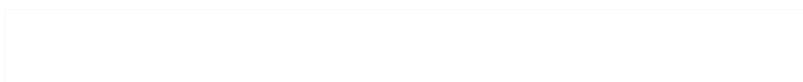
Q.NO : 10 a) Explain different types of fibers by giving the refractive index profiles and propagation details.   [8 M]

b) Explain the Total Internal Reflection with neat diagram   [6 M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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UG Model question paper

Time: 3 hours   ENGG GRAPHICS (R18A0302)   **Max Marks: 70**

BRANCH: B.TECH I - I (CSE,ECE,IT,EEE)

This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 Draw an ellipse when the distance of its vertex from its directrix is 24 mm and distance of its focus from directrix is 42mm.   [14 M]

OR

Q.NO: 2 a) Construct a scale of 1:40 to read meters and decimeters and long enough to measure up to 6 meters. Mark a distance of 4.7 m on it.

b) A 40 mm diameter circle rolls out side an arc of radius 70 mm for a circular distance of 120 mm.Trace the path of a point lying on the circumference of rolling circle, which is in contact with the arc in its initial position. Name the curve.   [14 M]

SECTION-II

Q.NO: 3 a) A point is 30 mm from the H.P. and 50 mm from the V.P. Draw its projections keeping it in all possible positions.   [4 M]

b) A 60 mm long line AB is parallel to and 20 mm in front of the V.P. The ends A and B of the line are 10 mm and 50 mm above the H.P respectively. Draw the projectors of the line and determine its inclination with the H.P.   [10 M]

OR

Q.NO: 4 The front view and top views of an 80 mm long line PQ measures 70 mm and 60 mm, respectively. The end P is on the H.P. and the end Q is in the V.P. Draw the projections of line PQ and determine its inclinations with the H.P and the V.P.   [14 M]

SECTION-III

Q.NO: 5. A hexagonal plane of side 30 mm has an edge in the V.P. The surface of the plane is inclined at 45^0 to the V.P. and the edge on which it rests is inclined at 30^0 to the H.P. Draw its projections.   [14 M]

OR

Q.NO: 6 A square pyramid of base side 40 mm and axis 55 mm is resting on one of its triangular faces on the H.P. A vertical plane containing the axis is inclined at 45^0 to the V.P. Draw its projections.   [14 M]
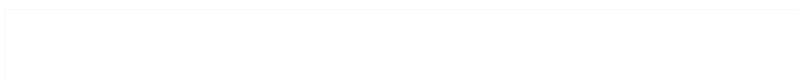
SECTION-IV

Q.NO: 7 Draw the isometric view of a hexagonal prism of base side 30 mm and axis 70mm. the prism is resting on its base on the H.P. with an edge of the base parallel to the V.P.   [14 M]

OR

Q.NO: 8 A square pyramid of base side 25 mm and axis 40 mm rests centrally over a cylindrical block of base diameter 50 mm and thickness 20 mm. Draw the isometric projection of the arrangement.   [14 M]

SECTION-V

Q.NO: 9 Draw the orthographic projections for the pictorial view shown in figure All dimensions are in mm   [14 M]
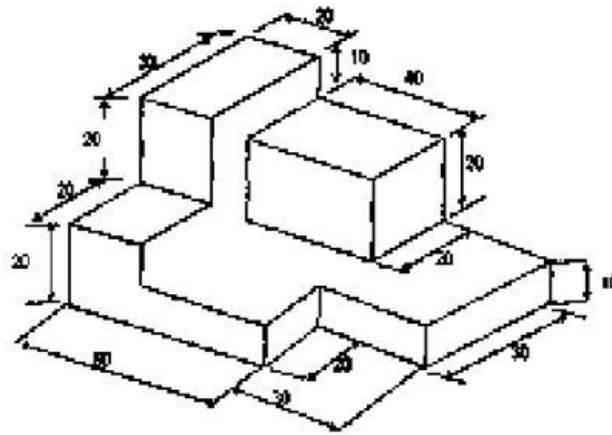
OR

Q.NO: 10 Draw the isometric view of the given orthographic projection of the object?

[14 M]
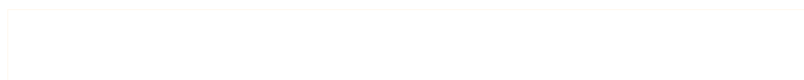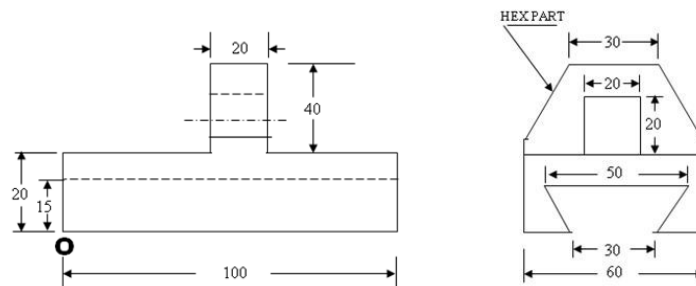
Time: 3 hours   ENGG GRAPHICS (R18A0302)   Max Marks: 70
BRANCH: B.TECH I - I (CSE,ECE,IT,EEE)

This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION I

Q.NO: 1 a) Draw hexagon with a side of 40 mm.   [4M]

  b) Draw the hyperbola when the focus and the vertex are 25 mm apart.   Consider   [10M]

  eccentricity as 3/2. Draw a tangent and normal to the curve at a point that is 35

  mm from the focus.

OR

Q.NO: 2 a) A line CD 75 mm long is parallel to VP. And perpendicular to HP. End C is 35 mm
        above HP. And 20 mm in front of VP. End D is above HP. Draw the projections of
        the line CD
    b) A straight line AB of 75 mm long, has the end A on V.P and the end B on H.P. The
      line is inclined at 30^0 to V.P and its front view makes an angle of 45^0 with xy. Draw
      the projections of the line   [6M]

SECTION II

Q.NO: 3 A rectangular lamina of size 50 mm × 40 mm has a coaxial circular hole of 30 mm
        diameter. It is resting on HP with a shorter edge perpendicular to VP. The surface of
        the lamina is inclined at 35^0 to HP. Draw the top, and front views.

OR

Q.NO: 4 A straight line AB of 75 mm long, has the end A on V.P and the end B on H.P. The   [14M]
        line is inclined at 30^0 to V.P and its front view makes an angle of 45^0 with xy. Draw
        the projections of the line and add the left side view and locate the traces.

SECTION III

Q.NO: 5 A rectangular lamina of size 50 mm × 40 mm has a coaxial circular hole of 30   mm [14M] diameter. It is resting on HP with a shorter edge perpendicular to VP. The surface of the lamina is inclined at 35^0 to HP. Draw the top, front and left side views.

OR

Q.NO: 6 a) A hexagonal prism with side of base 25 mm and 50 mm long is resting on a [8M] comer of its base on HP. Draw the projections of the prism when its axis is making 30° with HP and parallel to VP.

   b)   Draw the projections of a right circular cone of base 40 mm diameter and height [6M] 60 mm when resting with its base on HP.

SECTION IV

Q.NO: 7 Using First Angle Projection, Draw the Orthographic Views of the object shown in below Figure. [14M]
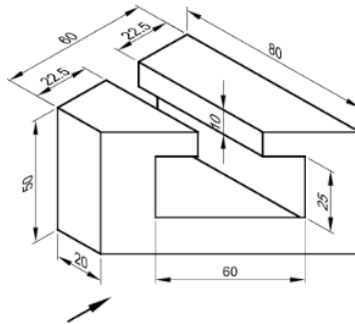
OR

Q.NO: 8 Draw three views of the following component in first angle projection. Take all dimensions are in mm.
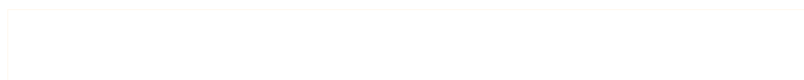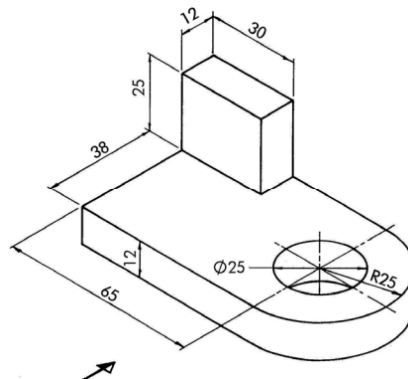
Q.NO: 9 Draw the isometric view of Figure 1.   [14 M]
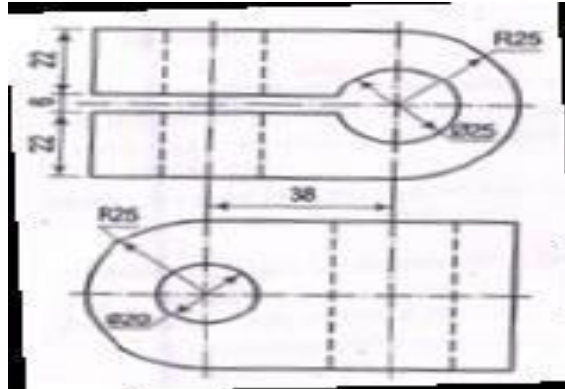
Q.NO: 10 Draw the elevation, plan and side view of the picture shown in the Figure 2. [14M]
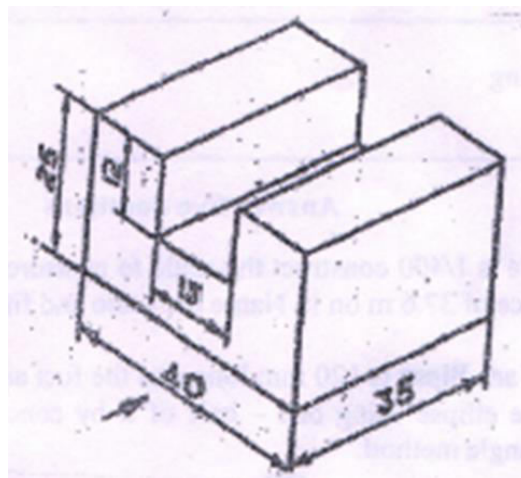
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours　　　　ENGG GRAPHICS (R18A0302)　　Max Marks: 70
BRANCH: B.TECH I - I (CSE,ECE,IT,EEE)

This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION -I

Q.NO: 1(a) Draw a plain scale of R.F 1:40 to read Metres and Decimetres and long enough to measure up to 8m. Show lengths of 4.3m and 6.2m on this scale.　　[7M]

(b) Draw the hyperbola when the focus and the vertex are 25mm apart. Consider eccentricity as 3/2. Draw a tangent and normal to the curve at a point that is 35 mm from the focus.　　[7M]

OR

Q.NO 2 A circle of 50mm diameter rolls on the circumference of another circle of 175mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. Draw a tangent and a normal to the curve at a point 125mm from the centre of the directing circle.[14M]

SECTION -II

Q.NO: 3 A 120 mm long line PQ is inclined at 45^0 to the HP and 30^0 to the VP A point m on the line is at a distance of 40 mm from p and its front view is 50 mm above the xy line and the top view is 35mm below the xy line, Draw its projection. Locate the traces.　　[14M]

OR

Q.NO: 4 A regular hexagonal lamina with its edge 50 mm has its plane inclined at 45^0 to HP and lying with one of its edges in HP. The plane of one of its diagonals is inclined at 45^0 to XY . The corner nearest to VP. is 15 mm in front of it. Draw its projections.　　[14M]

SECTION -III

Q.NO: 5 A pentagonal pyramid, side of pentagon 30mm and height 70mm is resting on HP on one of its base edges such that the triangular face containing that edge is perpendicular to HP and parallel to VP draw the projections.　　[14M]

OR

Q.NO: 6 A cylinder of diameter 30mm and axis height 60 mm lying on the ground on a point of its base circle such that the axis is inclined at 45^0 to the H.P and the plane containing the axis males an angle of 30^0 with the VP. Draw the projection of the cylinder.　　[14M]
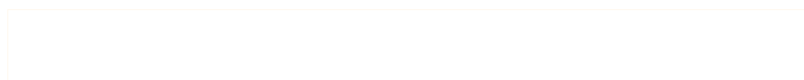
SECTION –IV

Q.NO: 7 A hexagonal prism of base 30 *mm* and height 70 *mm* is resting on its base on the HP with a side of the base perpendicular to the VP. The prism has a cylindrical hole of diameter 40mm drilled centrally such that the axis of the hole is perpendicular to the VP. Draw the development of the lateral surface of the prism.   [14M]

OR

Q.NO: 8 Draw the isometric view of Figure 1.   [14M]
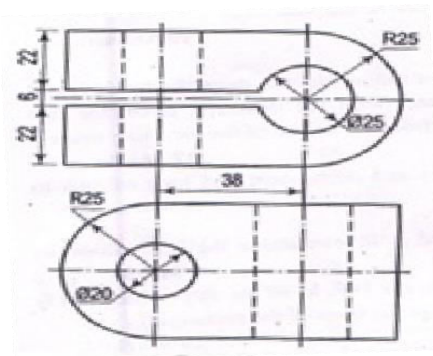
Figure 1

SECTION -V

Q.NO: 9 Draw the following views of the object shown pictorially in Figure 2.   [14M]
   (a)   Front view
   (b)   Top view and
   (c)   Side view
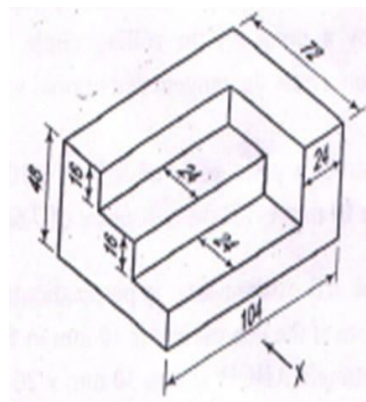
Figure 2
OR
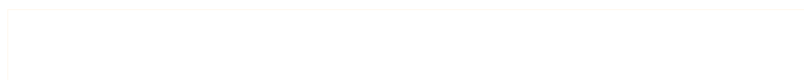
Q.NO: 10 Draw the elevation, plan and side view of the picture shown in the Figure 3.   [14M]

Figure 3

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   PROGRAMMING FOR PROBLEM SOLVING(R180501)   **Max Marks: 70**

BRANCH: B.TECH I - I (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q. No. 1 a) State the hardware and software in Computer system   [4 M]

b) Differentiate a flowchart and an algorithm with an example.   [10 M]

OR

Q. No. 2 a) Differentiate Type casting and co-ercion   [4 M]

b) Explain operator precedence and associativity   [10 M]

SECTION-II

Q. No. 3 a) Differentiate entry-controlled-loop and exit-controlled-loop   [8 M]

b) Write a C program to print the prime numbers between 1 and n.   [6 M]

OR

Q. No. 4 a) State the difference between break and continue statement with example.   [6M]

b) Write a C program to find arithmetic operations using switch statement   [8M]

SECTION-III

Q. No. 5 a) Clearly state the parameter passing techniques with example program.   [8 M]

b) State the difference between iteration and recursion.   [6 M]

OR

Q. No. 6 a) What is meant by inter function communication?   [8 M]

b) Write the syntax for function declaration, function definition, and function call[6M]

SECTION-IV

Q. No.7 a) Define an Array?   [2M]

b) Explain declaration and initialization of one dimensional array?   [4M]

c) Write a C program to find multiplication of matrices.   [8 M]

OR

Q. No.8 a) Write a C program to insert a sub-string into a given main string at a given position.   [6 M]

b) State any six string manipulation functions and explain.   [8 M]

SECTION-V

Q. No.9 a)What is a Pointer?   [2M]

b) Explain declaration and initialization of a pointer variable?   [6M]

c) Explain various arithmetic operations performed on pointers.   [6 M]

OR

Q. No. 10 a) Differentiate between a structure and Union. Give examples for each   [8 M]

b) Define: (i) enum (ii) bit-fields   [6 M]
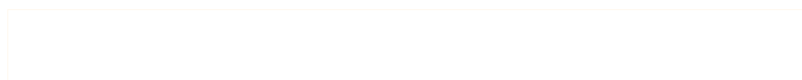
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   PROGRAMMING FOR PROBLEM SOLVING(R180501)   Max Marks: 70

BRANCH: B.TECH I - I (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q. No. 1 a) State the different computer languages.   [4M]

b) Draw the flowchart of finding largest of three positive numbers?   [5 M]

c) Define algorithm and write its properties   [5M]

OR

Q. No. 2 a) Explain the basic structure of a C program   [4M]

b) Write about different types of operators   [10M]

SECTION-II

Q. No. 3 a) State the different decision-making statements in C with example.   [14M]

OR

Q. No. 4 a) State the usage of goto statement.   [2M]

b) Differentiate while and do-while loop.   [6M]

c) Write a C program to generate the Fibonacci sequence.   [6M]

SECTION-III

Q. No. 5 a)Define function . Explain categories of functions with example programs .   [7M]

b)Describe parameter passing method with example program.   [7M]

OR

Q. No. 6 a) List out different types of storage classes   [8M]

b)Define recursion.Write a C program to find factorial of a number using recursion   [4M]

c)State the user-defined functions.   [2M]

SECTION-IV

Q. No. 7 a)Definearray.Declare an array and initialize it.Write about applications of array.[6M]

b) Explain the different types of arrays.   [4M]

c)Write a C program to perform addition of two matrices.   [4M]

OR

Q. No.8 a)Definestring.Write about string I/O functions with example   [7M]

b) Explain different string manipulation functions with example   [7M]

SECTION-V

Q. No. 9 a) Define pointer and state the uses of pointer.   [4M]

b) Explain pointer with arrays.   [4M]

c) Write a short note on pointer arithmetic   [6M]

OR

Q. No. 10 a)State the definition and format for accesing the members of a structure.   [6M]

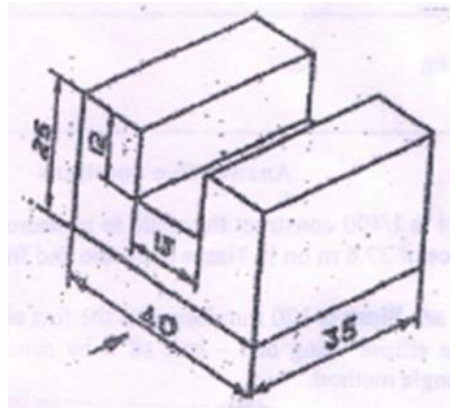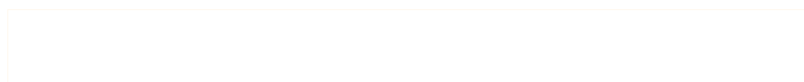b) Compare structure and union and write a program on each of them.   [8M]
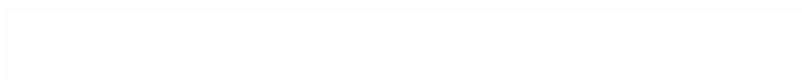
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   PROGRAMMING FOR PROBLEM SOLVING(R180501)   Max Marks: 70

BRANCH: B.TECH I - I (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q. No. 1 a) What is an Algorithm? Discuss basic characteristics of algorithm?   [7M]

b) What do you mean by flow chart? Explain it with Example?   [7M]

OR

Q. No. 2 a) Explain: (i) Keyword (ii) Identifier (iii) Constant (iv) Datatype   [8M]

b) State the precedence of operators with example.   [6M]

SECTION-II

Q. No. 3 a) State the difference between the usages of else-if ladder and nested if-else in detail.   [8M]

b) Write a short note on multi-way selection.   [6M]

OR

Q. No. 4 State the usage of loops with example program for each of them.   [14M]

SECTION-III

Q. No.5 a) Define function. Explain categories of functions with example programs.   [7M]

b) Describe parameter passing techniques with example program.   [7M]

OR

Q. No.6 a) List out different types of storage classes in C with example for each.   [8M]

b) Define recursion. Write a C program to find factorial of a number using recursion.   [4M]

SECTION-IV

Q. No.7 a) Define array. Declare an array and initialize it. Write about applications of array.   [8M]

b) Write a C program to display the transpose of a matrix.   [6M]

OR

Q. No.8 a) Define String. Explain declaration and initialization of strings.   [6M]

b) Explain the different String manipulation Functions.   [8M]

SECTION-V

Q. No. 9 a) Define a pointer.   [2M]

b) Explain declaration and initialization of pointer variable.   [6M]

c) Explain Pointer with arrays.   [8 M]

OR

Q. No. 10 a) Differentiate structure and union with example.   [8M]

b) What are bit-fields? Write a program illustrating the usage of bit-fields.   [6M]
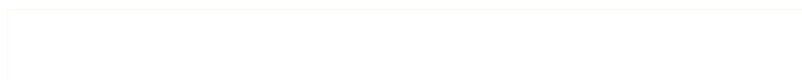
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   PROFESSIONAL ENGLISH (R18A0002)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

Q. No. 1 a) What are finite and non-finite verbs? Supply three examples for each.   [5M]
    b) Describe you first day engineering college experience. (300 words)   [5M]
    c) Write a paragraph on 'women safety in India'.   [4M]
.

OR

Q. No. 2 a) Write a brief note on Bill Gates TED talk?   [5M]
    b) Write a note on importance of business vocabulary.   [4M]
    c) List out five dos and don'ts of paragraph writing.   [5M]

SECTION-II

Q. No. 3 a) Write down any seven idioms with example sentences.   [7M]
    b) Write down seven tips to give effective presentation.   [7M]
OR
Q. No. 4 a) What are the tips to follow to write an effective 'Abstract'   [5M]
    b) Write down five dos and five don'ts to make an effective presentation   [5M]
    c) Rewrite the following Simple Sentences as Compound Sentences.   [4M]

    1.   The old man being weak could not walk properly.
    2.   His father in spite of being poor is a contended man.
    3.   She must work hard to be successful in the examination.
    4.   Our teacher is popular among students for his diligence.

SECTION-III

Q. No.5 a) Change the following direct speech sentences into indirect speech.   [4M]
        1."Where is your sister?" she asked me.
        2."I never make mistakes," he said
        3."I can't drive a lorry," he said.
        4."Don't waste your money" she said.
    b) Write any five standard abbreviations with their full form.   [5M]
    c) Write down any five likely-to-be-asked questions in an interview.   [5M]
OR
Q. No.6 a) Write a cover letter of your own which displays your core qualifications.   [10M]
    b) List out four dos and four don'ts of writing a cover letter.   [4M]

SECTION-IV

Q. No. 7 a) How do you ace a telephonic interview?   [7M]

       b) Write a telephonic interview conversation between an HR and an fresh applicant
         for a post that he/she applied for. .   [7M]

OR

Q. No.8 a) Frame a resume for the post of junior engineer at fabrics ltd.?   [7M]

      b) Write down five dos and five don'ts of resume making.   [7M]

SECTION-V

Q. No.9 a) What is the importance of professional etiquette? Mention any seven.   [7M]

       b) Write a report on your college annual day.   [7M]

OR

Q. No.10 a) Correct the following sentences.   [7M]

        1. Myself suresh kumar form Delhi.
        2. I am having four brothers.
        3. He don't have a latop
        4. Does she has a car?
        5. He didn't wrote exam.
        6. I came to office by walk.
        7. Our classroom is in the second floor.

   b) Complete the following analogies.   [7M]

1. Author : novel : : _____ : song
  A)   singer   B)   musician   C)   composer   D)   writer

2. Wind : blow : : rain : _____
  A)   flood   B)   water   C)   fall   D)   drops

3. Profess : creed : : advocate : _____
  A)   nuance   B)   intimations   C)   cherub   D)   doctrine

4. Inarticulate : verbal : : contemporary : _____
  A) delicate   B)   Philistine   C)   prehistoric   D)   mortal

5. Ludicrous : satirical : : delicious : _____
  A)succulent   B)   intriguing   C)   obscure   D)   grasping

6. Conspicuous: obscure: : eccentric : _____
  A)picturesque   B)   tedious   C)   conventional   D)   foolhardy

7. Smile : happiness : : crocus : _____
  A)   flower   B)   spring   C)   garden   D)   planting
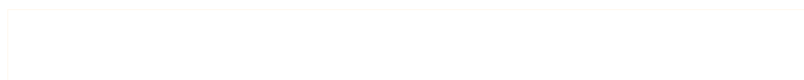
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   PROFESSIONAL ENGLISH (R18A0002)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 a) What are the steps involved in an oral presenttion?   [7M]
          b) Describe your college in your own words.   [7M]

OR

Q.NO:2 a) Underline the verbs in the statements and mention whether it is finite or Non-
          finite.   [3M]
          i.   Nancy does her homework every day   ii. They are writing a letter
          iii. He has a big care   iv. She speaks Chinese very well.
          V. The proposal has been examined today vi. Hema is doing her homework now.

          b) Write three paragraphs about smart phone addiction.   [7M]
          c) Identify the business vocabulary in the following sentences   [4M]
           i. The company has reasons for its actions.
           ii. Industrial action has affected production.
           iii. We need to develop an action plan.
           iv. Let's use an advertising agency.

SECTION-II

Q.NO: 3. a) Use the following idioms in sentences of your own.   [4M]
           i. A hot potato   ii. A penny for your thought
           iii. Ball is in your court   iv. Back to the drawing board
          b) Write an abstract for the paper that you are going to publish in your core journal .
             (Words restricted to 150)   [8M]
          c) Convert the given simple sentences into complex sentences   [2M]
           i. I finished my work. I went out   ii. I breathe alright. At least I think so.

                                                OR

Q.NO: 4. a) Suggest the most important points to your friend who is going to make his first
              public speaking speech.   [7M]
           b) Match the suitable idioms from the I column with the sentences given in column-
              II.   [4M]
           i   Once in a blue moon   a   I am sure your performance will be great
           ii   A piece of cake   b   Seldom I go to the library
           iii   Break a leg   c   Two business giants finally agreed with each other
           iv   See eye to eye   d   Today's exam was very easy
          c. Write a small abstract of 50 words to present your proposal on your project.   [3M]

SECTION -III

Q.NO: 5 a) Write at least eight exchanges of conversation between a HR and a fresher (the latter, seeking for the post of Assistant engineer in L&T). [8M]

   b) Expand the given standard abbreviations. [3M]
      i. ISRO ii. CBI iii. ONGC iv. ASAP v.ETA vi. CEO

   c) Change the sentences as directed [3M]
         i . "What time does the train arrive? " She asked. (Change into indirect speech)
         ii.   She asked when they could have dinner. (Change into direct speech)
         iii. Peter said to John," Good luck". (Change into indirect speech)

OR

Q.NO: 6 a) Write a job application letter to the HR of Crystal systems. The job description is as follows: Needed Fresh Engineering Graduates, graduated in the year 2018 from CSE/IT discipline with basic knowledge in Oracle and should also possess excellent communication skills. [8M]

   b) Write down ten most important interview skills that will get you hired for a job. [6M]

SECTION-IV

Q.NO: 7 Respond to the given job description with both your job application letter and Resume' to the HR of the Company, TVS Lucas. [14M]
   Job Description is as follows:
   Title: Total Quality Manager ; Basic Qualification: B.Tech in Mechanical Engineering/ Electrical Engineering. Preference will be given to candidates without any standing backlogs. Knowledge of Robotics and Multi skilled in basic Electrical practices is a requirement.

OR

Q.NO: 8 a) List out ten keys to succeed in a telephonic interview. [8M]
   b) Choose the right analogy from the following [6M]
   i. iron: Fe :: Silver :_____ (Na, Cl, Ag, K)
   ii. Warm: hot; _____ ::hilarious (Humid, raucous, summer amusing)
   iii. board : train ; _____:: horse (stable, shoe ,ride, mount)
   iv. Son: Nuclear ; _____ :: Extended (father, mother , cousin and daughters)
   v. Poetry: Rhyme; Philosophy::_____ (imagery, music, bi- law, theory)
   vi. fear: Composure; _____:: Zenith (apex, heaven, heights, nadir)

.   **SECTION-V**

Q.NO: 9 a) List out the professional etiquette to be followed in your workplace. [7M]
   b) Write a Report to your Manager about the recent internal inspection conducted for the year end stock verification. [7M]

OR

Q.NO: 10 a) Assume yourself as the Class representative and write a report to your HOD about the recent workshop you attended in IIT Hyderabad.   [8M]

b) Spot the errors in the following sentences: [6M]

   i.   An European visited India
  ii.   Everyone must brew their own coffee.
 iii.   Divide this apple between the girls.
 iv.   The boys with their teacher is out in the fields
  v.   The teacher was impressed with I and Mark
 vi.   Yedi is a man that loves his work more than anything else in the world.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

Time: 3 hours   PROFESSIONAL ENGLISH (R18A0002)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q. No. 1. a) What does Bill Gates discuss in his TED talk?   [5M]

　　　　 b) Describe your mother.   [5M]

.   c) Write paragraph on "FIFA World Cup"   [4M]

OR

Q. No. 2 a) Write a note on Bill Gate's TED talk on Solving Big problems?   [6M]

　　　　b) Describe a place of your choice.   [6M]

　　　　c) What is business vocabulary? Give two examples.   [2M]

SECTION-II

Q. No. 3 a) What inspiration do you get from Google CEO, Sundar Pichai's speech?   [7M]

　　　　b) Write an abstract on "Women Empowerment"   [7M]

OR

Q. No. 4 a) What are the dos and don'ts of Oral Presentation?   [6M]

　　　　b) Write sentences by using the following idioms.   [2M]

　　　 1) Black sheep 2) Once in a blue moon 3) A big wig 4) A wet blanket

　　　 c) Define simple, complex and compound sentences with two examples for each [6M]

SECTION-III

Q. No. 5 a) Write any three questions with answers asked in interviews?   [7M]

　　　　b) Write a resume and cover letter for the post of Software Professional in Wipro.[7M]

OR

Q. No.6 a) Convert the following sentences into indirect speech   [5M]

　　　　　1. He said, "I am going to canteen to have a cup of tea."

　　　　　2. Ram said to Sam, "Did they meet you yesterday?"

　　　　　3. " Please post these letters" Rana said to Mona.

　　　　　4. She said to her mother, "Why have you broken my glass?"

　　　　　5. They said," We have won the match!"

　　　　b) Write a note on Mock Interviews.   [5M]

　　　　c) Write any 4 standard abbreviations.   [4M]

SECTION-IV

Q. No. 7a) What are the advantages of Telephonic Interviews?   [5M]

　　　　b) Write any five expressions used in telephonic interviews.   [5M]

　　　　c) Use the correct auxiliary verbs in the following blanks.   [4M]

　　　 1) _____you a student?

2) He _____not like tea.

3) He _____not come yet.

4) They _____invited him to the party

OR

Q.No. 8. a) What are the requisites of resume writing? [5M]

b) Write a dialogue between the interviewer and interviewee on telephone. [5M]

c) Choose the right word and fill in the blanks. [4M]

1. virus : illness : : flood : _____

a. rain b. destruction c. hurricane d. drought

2. olive branch : peace :: lamb : _____

a. meekness b. evil c. love d. royalty

3. smart: intelligent :: ecstatic : _____

a. despaired b. blissful c. unhappy d. miserable

4. sweet : sour :: _____ : biased

a. impartial b. concerned c. unfair d. predisposed

SECTION-V

Q. No.9 a) Write your comment on Tanmay Bhakshi's ITU interview. [5M]

b) What is Professional Etiquette? Explain with examples. [5M]

c) Choose the right word and fill in the blanks. [4M]

1. _____ : zenith ::fear : composure

a.   apex b. heaven c. Heights d. nadir

2. _____ : trail :: grain : grail

a.   train b. path c. wheat d. holy

3. poetry : rhyme :: philosophy : _____

a.   imagery b. music c. bi-law d. theory

4. humble: arrogance :: miserable: _____

a. mournfulness b. gloom c. elation d. distress

OR

Q. No. 10 a) Write report on the "Technical Fest in your college". [7M]

b) Correct the following sentences. [7M]

1. Every one of the shirts have a green collar.

2. They have been studying since two hours.

3. They have met with their friends.

4. I doesn't come to college every day.

5. They have visited Kashmir last year.

6. He has four brother-in-laws.

7. She have four brother.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   MATHEMATICS-II (R18A0022)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks
.

SECTION-I

Q.NO: 1 a) Find a root of an equation $3x = cos x + 1$ using Newton Raphson method.

b) Construct difference table for the following data

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
y	0.003	0.067	0.148	0.248	0.370	0.518	0.697

and find $f(0.6)$.   [7+7M]

OR

Q.NO: 2 a) Find the value of y when x = 3 and also find interpolating polynomial function using Lagrange's Interpolation formula from the following data.

x	0	1	2	5
y	-2	6	9	15

b) Find a root of an equation x $\log_{10} x$= 1.2 using Bisection method which lies between 2 & 3.   [7+7M]

SECTION-II

Q.NO: 3 Evaluate $\int_{0}^{1} \frac{1}{1+x^2} dx$ using (i) Simpsons rule (ii) Simpsons $\frac{3}{8}$ rule iii)Trapezoidal rule

and compare the results with its actual values.   [14M]

OR

Q.NO: 4 Solve $\frac{dy}{dx} = x - y^2$, y(0) =1 find y(0.3) by taking h= 0.1using modified Euler's method .

[14M]

SECTION-III

Q.NO: 5 a) Find $\int_{0}^{3} \frac{dx}{\sqrt{9-x^2}}$

b) Show that $\int_{a}^{b} (x-a)^{m} (b-x)^{n} dx = (b-a)^{m+n+1} \beta(m+1,n+1)$ [7+7M]

OR

Q.NO: 6 a) Show that $\int_{0}^{\infty} e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$ 、

b) If m and n are +ve integers, then Prove that $\beta(m,n) = \dfrac{(m-1)!(n-1)!}{(m+n-1)!}$ [7+7M]

SECTION-IV

Q.NO: 7 a) Change the order of integration and evaluate $= \int_0^a \int_{x/a}^{\sqrt{x/a}} (x^2 + y^2)\,dx\,dy$

b)Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dx\,dy\,dz$ [7+7M]

OR

Q.NO: 8 a) Change the order of integration in $\int_0^1 \int_{x^2}^{2-x} xy\,dx\,dy$ and hence evaluate the double

integral.

b) Evaluate the integral by changing to polar co-ordinates $\int_0^a \int_0^{\sqrt{a^2-y^2}} (x^2 + y^2)\,dx\,dy$

[7+7M]

SECTION-V

Q.NO: 9 a)Verify Green's theorem in plane for $\oint (2xy - x^2)\,dx + (x^2 + y^2)\,dy$, where 'c' is
the closed curve of the region bounded by $y = x^2$ and $x = y^2$. [7+7M]
b) Find the unit normal vector to the surface $x^2 + y^2 + 2z^2 = 6$ at the point $(2,2,3)$.

OR

Q.NO: 10 a) State Gauss Divergence Theorem. [4+10M]

b) Evaluate $\iint\limits_{S} \bar{F}.\bar{n}\,ds$ where $\bar{F} = 2x^2 y\bar{i} - y^2\bar{j} + 4xz^2\bar{k}$ and 's'is closed the surface of

the region in the first octant bounded by the cylinder $y^2 + z^2 = 9$ and planes x=0, x=2,

y=0, z=0.
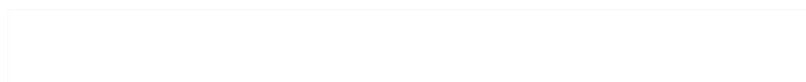
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   **MATHEMATICS-II (R18A0022)**   Max Marks: 70
BRANCH: B.TECH I - II (COMMON TO ALL)
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks
.

SECTION-I

Q.NO: 1 a) Using Newton's forward interpolation formula, and the given table of values

X	1.1	1.3	1.5	1.7	1.9
$f(x)$	0.21	0.69	1.25	1.89	2.61

Obtain the value of $f(x)$ $when$ $x = 1.4$

b) Find a root of an equation $e^x \sin x = 1$ using Regula false method.   [7+7M]

OR

Q.NO: 2 a) Using Gauss back ward difference formula, find y(8) from the following table

x	0	5	10	15	20	25
y	7	11	14	18	24	32

b) Find a root of an equation $x^4 - x - 10 = 0$ using Bisection method.   [7+7M]

SECTION-II

Q.NO: 3 a) Using Taylor series method, find an approximate value of y at x = 0.2 for the
differential equation $y' - 2y = 3e^x$ for y (0) = 0.

b) Derive the normal equation to fit the straight line $y = a + bx$.   [10+4M]

OR

Q.NO: 4 a) The velocity v (m/sec) of a particle at distance S(m) from a point on its path given
by following table

S	0	10	20	30	40	50	60
v	47	58	64	65	61	52	38

Estimate the time taken to travel 60 meters by Simpsons 1/3 and 3/8 rules.

b)Derive the normal equation to fit the parabola $y = a + bx + cx^2$.   [8+6M]

SECTION-III

Q.NO: 5 a) Show that $\overline{|(n)|} = \int_0^1 \left(\log \frac{1}{x} \right)^{n-1} dx, n > 0$

b) Show that $\beta(m,n) = \int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}} dx$ [7+7M]

OR

Q.NO: 6 a) Prove $\int_0^1 x^m (\log x)^n dx = \dfrac{(-1)^n n!}{(m+1)^{n+1}}$

b) Prove that $\int_b^a (x-b)^{m-1} (a-x)^{n-1} dx = (a-b)^{m+n-1} \beta(m,n)$ [7+7M]

SECTION-IV

Q.NO: 7 a) Evaluate $\iint r^3 dr d\theta$ over the area included between the circles r=2sin θ and r=4 sin θ

b) Change the order of integration in $\int_0^1 \int_{x^2}^{2-x} xy\,dx\,dy$ and hence evaluate the double integral. [7+7M]

OR

Q.NO: 8 a)Evaluate $\iint (x^2 + y^2)dx\,dy$ over the area bounded by the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$

b)Evaluate $\int_0^{\pi/4} \int_0^{a\sin\theta} \dfrac{r dr d\theta}{\sqrt{a^2 - r^2}}$ [7+7M]

SECTION-V

Q.NO: 9 a) If $=(5xy-6x^2)\,\bar{i} +(2y-4x)\,\bar{j}$, evaluate $\int_C \bar{F}.d\bar{r}$ along the curve C in xy-plane y=x³from (1,1) to (2,8).

b) Show that the vector $(x^2 - yz)\bar{i} + (y^2 - zx)\,\bar{j} + (z^2 - xy)\bar{k}$ is irrotational and find its scalar potential. [7+7M]

OR

Q.NO: 10. Find $\int_s \bar{F}. \bar{n}dS$ where $\bar{F} =2 x^2\bar{i} - y^2\bar{j} + 4xz\bar{k}$ and S is the region in the first octant bounded by $y^2 + z^2 =9$ and x=0,x=2. [7+7M]
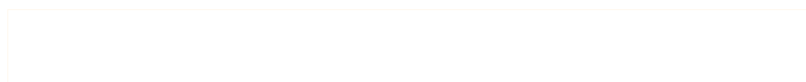
Time: 3 hours   MATHEMATICS-II (R18A0022)   Max Marks: 70
BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 a) Using Bisection method ,find the negative root of $x^3 - 4x + 9 = 0$ correct to two decimals.

   b) Using appropriate interpolation formula ,find y(8) from the following table   [7+7M]

x	0	5	10	15	20	25
y	7	11	14	18	24	32

OR

Q.NO: 2 a) A curve passes through the points (0,18) ,(1,10),(3,-18) and (6,90).Find the slope of the curve at x=2.

   b) By using Iteration method find a root for the equation $f(x) = 2x - \log_{10} x - 7 = 0$

[7+7M]

SECTION-II

Q.NO: 3 a) Find a and b so that $y = ab^x$ best fits the following data.

x	0.2	0.3	0.4	0.5	0.6	0.7
y	3.16	2.38	1.75	1.34	1.00	0.74

   b) Using Taylor series method, find an approximate value of y at x = 0.2 for the differential equation $y' - 2y = 3e^x$ for y (0) = 0.   [7+7M]

OR

Q.NO: 4 a) Evaluate $\int_0^1 \frac{1}{1+x} dx$ by using trapezoidal , simpson's 1/3,Simpsons 3/8 rule   [7+7M]

   b) Fit a parabola of the form $y = ax^2 + bx + c$

X	1	2	3	4	5	6	7
Y	2.3	5	9.7	16.5	29.4	35.5	54.4

SECTION-III

Q.NO: 5 a) Prove $\beta(m,n) = 2\int_0^{\pi/2} \sin^{2m-1}\theta \cos^{2n-1}\theta d\theta$.   [7+7M]

   b)Prove $2^{2n-1}\overline{|(n)}\left|\left(n+\frac{1}{2}\right)\right. = \overline{|(2n)}.\sqrt{\pi}$

OR

Q.NO: 6 a) Show that $\int_0^{\frac{\pi}{2}} sin^2\theta cos^4\theta \, d\theta = \frac{\pi}{32}$ [7+7M]

b) Prove $\Gamma(n)\Gamma(1-n) = \frac{\pi}{sinn\pi}$.

SECTION-IV

Q.NO: 7 a) Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)dx \, dy \, dz$

b)Change the order of Integration and evaluate   [7+7M]

OR

Q.NO: 8 a) Evaluate $\iint(x^2+y^2)dx \, dy$ in the positive quadrant for which $x+y \le 1$ [7+7M]

b) Evaluate $\int_{0}^{1}\int_{0}^{\sqrt{1+x^2}} \frac{dydx}{1+x^2+y^2}$

SECTION –V

Q.NO: 9 Verify Green's theorem in a plane for $\int_c \left[(xy+y^2)dx+x^2dy \right]$ when 'c' is added by

$y = x$ and $y = x^2$ [14M]

OR

Q.NO: 10 Verify stoke's theorem for $\overline{F}=(x^2-y^2)\overline{i}+2xy\overline{j}$ over the box bounded by planes
x=0,x=a ,y=0,y=b.   [14M])
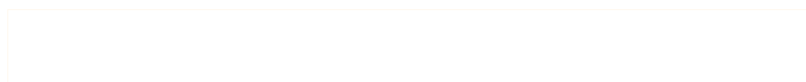
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   **ENGINEERING CHEMISTRY (R18A0012)**   Max Marks: 70
BRANCH: B.TECH I - II (ECE, EEE, CSE, IT)
Note: This question paper contains of 5 sections. Answer five questions, choosing one
question from each section and each question carries 14 marks

SECTION-I
Q.NO: 1 a) Explain the construction & working of H_2- O_2 fuel cell. Give the advantages and
applications of fuel cells.   [7M]
b) Write process and applications of Electroplating and Electroless plating.   [7M]
OR
Q.NO: 2 a) Define primary battery. Write a note on Li cells.   [7M]
b) Write causes and effects of corrosion.   [4M]
c) Explain oxidation corrosion.   [3M]

SECTION-II
Q.NO: 3 a) State the postulates of Molecular Orbital theory.   [4M]
b) Draw the Molecular Orbital energy level diagram of N_2 molecule.   [4M]
c) Explain LCAO method.   [6M]
OR
Q.NO: 4 a) State the salient features of crystal field theory.   [7M]
b) Discuss the splitting of d-orbitals in case of octahedral complexes.   [7M]
SECTION-III
Q.NO: 5 a) Explain disinfection of water by chlorination and ozonization.   [7M]
b) Explain how to estimate harness of water by EDTA method.   [7M]
OR
Q.NO: 6 a) Differentiate between temporary hardness and permanent hardness   [4M]
b) Explain how to soften hard water by ion exchange process. Give merits and
demerits of the process.   [10M]

SECTION-IV
Q.NO: 7 Define organic reactions. How are they classified? Discuss the mechanism of
nucleophilic substitution (S_N1 and S_N2) with examples.   [14M]
OR
Q.NO: 8 a)Write reaction of dehydrohalogenation of alkylhalide by using E1 elimination.   [7M]
b) Discuss reduction reaction. Explain reduction of ketone and aldehyde compounds
by using $LiAlH_4$ and $NaBH_4$ with reactions.   [7M]

SECTION-V
Q.NO: 9 a) Explain ultimate analysis of coal with its significance.   [7M]
b) Define petroleum. How is it refined by fractional distillation? Write various
fractions with boiling range.   [7M]

OR

Q.NO: 10 a) Define cracking. Explain fluid bed catalytic cracking with neat sketch   [7M]

b) Write note on:

(i) Knocking, (ii) Octane number, (iii) Cetane number   [7M]
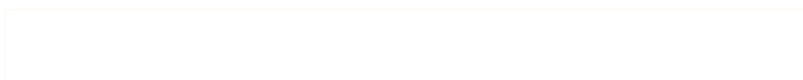
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   ENGINEERING CHEMISTRY (R18A0012)   Max Marks: 70
BRANCH: B.TECH I - II (ECE, EEE, CSE, IT)
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I
Q.NO: 1 a) What is Galvanic cell? Explain the construction and working principle of Galvanic Cell.   [7M]
        b) Derive Nernst equation for single electrode potential and explain the terms involved in it. Write its applications.   [7M]
OR
Q.NO: 2 a) Write charging and discharging reactions of Li-ion cells with applications   [7M]
        b) Explain Rusting of iron with the help of electro chemical theory of corrosion.[7M]
SECTION-II
Q.NO: 3 a) Define Atomic and molecular Orbital .Draw the molecular orbitals of diatomic molecules.   [4M]
        b) Draw the MO diagrams of N_2 and O_2 molecules and prove that the molecule of oxygen is paramagnetic in nature.   [10M]
OR
Q.NO: 4 a) Define metallic bond. Explain the limitations of Valence bond Theory.   [4M]
        b) Explain the crystal field splitting of d-orbitals in case of octahedral and tetrahedral complexes.   [10M]
SECTION-III
Q.NO: 5. a) Define hard water ,soft water ,hardness, temporary hardness ,permanent hardness and units of hardness.   [7M]
        b) Explain the principle involved in EDTA method.   [7M]
OR
Q.NO: 6 a) What is potable water .Write its specifications.   [4M]
        b) Explain Softening of water by Ion-Exchange method and how ion exchange resins are regenerated.   [10M]
SECTION-IV
Q.NO: 7 a) Explain Peroxide effect with example.   [4M]
        b) Write a note on Electrophiles and Nucleophiles.   [4M]
        c) Explain Nucleophilic addition with example.   [6M]
OR
Q.NO: 8 a) Explain addition reaction. Write reaction of Br_2 and HBr on alkenes   [4M]
        b) Explain Electrophilic addition by Markownikoff Rule.   [6M]
        c) Differentiate between S_N^1 and S_N^2 reactions.   [4M]
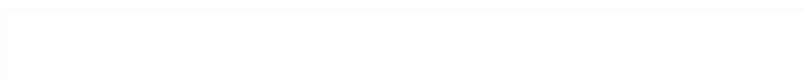
SECTION-V

Q.NO: 9 a) Explain the proximate and ultimate analysis of coal with its significance. [14M]

OR

Q.NO: 10 a) Define cracking. Explain the process of fluid bed catalytic cracking with a neat
sketch.   [10M]

b)Write constituents ,characteristics and uses of Natural gas, LPG and CNG.   [4M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper
Time: 3 hours   **ENGINEERING CHEMISTRY (R18A0012)**   Max Marks: 70
BRANCH: B.TECH I - II (ECE, EEE, CSE, IT)
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I
Q.NO: 1 a) Explain the construction, working and applications of Lead acid storage cell.   [7M]
     b) Define electrode potential and EMF.   [3M]
     c) What is a battery? How does it differ from a cell?   [4M]
OR
Q.NO: 2 a) What is cathodic protection. Explain both sacrificial anodic and impressed current cathodic protection method.   [10M]
     b) Define galvanizing and tinning and write their applications.   [4M]
SECTION-II
Q.NO: 3 a) Discuss the crystal field splitting of d-orbital in case of tetrahedral complex [10M]
     b) Write a note on bonding and anti-bonding orbitals   [4M]
OR
Q.NO: 4 a) Discuss briefly about MOT. Discuss the formation of O_2 molecule on the basis of MOT.   [10M]
     b) Differentiate between atomic and molecular orbitals.   [4M]
SECTION-III
Q.NO: 5 a) Explain ion exchange resin process for treatment of boiler feed water.   [10M]
     b) Define hardness and explain the types of hardness of water.   [4M]
OR
Q.NO: 6 a) What is desalination of brackish water? Describe desalination of brackish water by reverse osmosis method.   [10M]
     b) Write specifications of potable water.   [4M]
SECTION-IV
Q.NO: 7. a) What are organic reactions? Explain in detail about nucleophlic substitution reactions (S_N1 and S_N2) with examples.   [10M]
     b) State Markonikov's rule with examples.   [4M]
OR
Q.NO: 8 a) Explain in detail about elimination reactions (E_1 and E_2) with examples.   [10M]
     b) Define oxidation. Write the oxidation of alcohols in presence of $KMnO_4$ and chromic acid.   [4M]
SECTION-V
Q.NO: 9 a) Explain the proximate analysis of coal and its significance   [10M]
     b) Define fuel. Give classification and characteristics of a good fuel.   [7M]
OR
Q.NO: 10 a) Write a short note on knocking, octane and cetane number.   [7M]
     b) What is Cracking? Explain the fluid bed catalytic cracking with a neat sketch. [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   OBJECT ORIENTATED PROGRAMMING (R18A0502)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q. No. 1 a)Describe OOP concept in C++   [7M]
          b)List out operators and describe them   [7M]
OR
Q. No. 2 a)Write the structure of C++ program   [4M]
          b) Differentiate OOP and POP(7M)
          c)What is the purpose of Namespace   [3M]

SECTION-II

Q. No. 3 a)Describe inline function.   [5M]
          b)Write about access control with examplr program each   [4M]
          c)Define friend function   [5M]
OR
Q. No. 4 a) What are default arguments   [7M]
          b)Write about static class members.   [7M]

SECTION-III

Q. No. 5 a)Describe types of constructors.   [7M]
          b) Explain Dynamic constructor with an example   [7M]
OR
Q. No.6 a)List out types of inheritance .Explain   [7M]
          b) Define destructor .Explain with an example program   [3M]
          c)Clearly explain constructor s in derived class   [4M]

SECTION-IV

Q. No. 7 a)Explain Runtime polymorphism.   [7M]
          b) Describe virtual function with an example.   [7M]
OR
Q. No. 8 a)Describe about Dynamic memory allocation with its functions   [7M]
          b) Explain about pointer and functions   [7M].

SECTION-V

Q. No. 9 a)Explain types of templates.   [7M]
          b) Describe types of Exception.   [7M].
OR
Q. No. 10 a)Expalin class templates with multiple parameters.   [5M]
          b) Clearly describe Rethrowing an exception   [5M]
          c)Write about specification exception.   [4M]
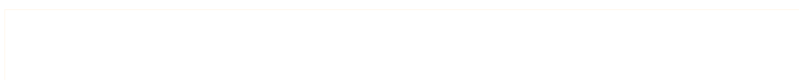
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   OBJECT ORIENTATED PROGRAMMING (R18A0502)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q. No. 1.a)Explain the differences between POP and OOP.   [7M]
  b)Explain the different types of data types in C++.   [7M]

OR

Q. No. 2.a)Explain the different types of operators in C++.   [7M]
  b)Write a C++ program to print the Fibonacci sequence of first n terms.   [7M]

SECTION-II

Q. No. 3.a)Explain class and object with an example program   [7M]
  b)Explain inline function with an example program.   [7M]

OR

Q. No. 4.a)Explain friend function with an example program.   [7M]
  b)Write about static data members and static member functions.   [7M]

SECTION-III

Q. No. 5.a)Describe the different types of constructors in C++.   [7M]
  b)Explain multiple inheritance with an example program.   [7M]

OR

Q. No.6.a)Explain the differences between constructors and destructors.   [7M]
  b)Explain hierarchical inheritance with an example program   [7M]

SECTION-IV

Q. No. 7.a)Explain the different types of polymorphisms in C++.   [7M]
  b)Explain virtual functions with an example program.   [7M]

OR

Q. No. 8.a)Describe about dynamic memory allocation with its functions.   [7M]
  b)Explain operator overloading with an example program.   [7M]

SECTION-V

Q. No. 9.a)Explain the different types of templates in C++.   [7M]
  b)Expalin exception handling mechanism in C++.   [7M]

OR

Q. No. 10.a)Expalin class templates with multiple parameters.   [7M]
   b) Explain the different types of exceptions with an example program.   [7M]
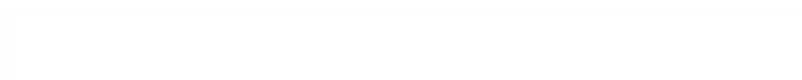
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   OBJECT ORIENTATED PROGRAMMING (R18A0502)   Max Marks: 70

BRANCH: B.TECH I - II (COMMON TO ALL)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION -I

Q. No. 1 a)Explain Basic Concepts of OOP in C++.   [7M]
b)Explain the following concepts in C++?   [7M]
i)typecasting   ii)reference variables.

OR

Q. No. 2 a)Write the structure of C++ program.   [4M]
b) Differentiate OOP and POP.   [7M]
c)What is the purpose of Namespace.   [3M]

SECTION-II

Q. No. 3 a)Explain inline function with program.   [5M]
b)Explain objects as function arguments with program   [4M]
c)Write a C++ program for friend function .   [5M]

OR

Q. No. 4 a) Explain array of objects with program.   [7M]
b)Explain about static member functions with program.   [7M]

SECTION-III

Q. No. 5)Define Constructor.Explain the following Constructors with programs.   [14M]
a)Parameterized constructor   b)Copy constructor   c)Dynamic constructor.

OR

Q. No.6 a)Explain different types of inheritance with programs .   [14M]

SECTION-IV

Q. No. 7 a)Explain this pointer with program.   [5M]
b) Explain abstract classes with program.   [5M]
c)Write a C++ program to overload unary operator(++)?   [4M]

OR

Q. No. 8 a)Explain about virtual base classes with program.   [5M]
b) Write a C++ program to overload binary operator(+).   [4M]
c)Explain pointers to derived classes with program ?   [5M]

SECTION-V

Q. No. 9 a) Explain function templates with multiple parameters.   [5M]
b) Explain about specifying exceptions with program.   [5M]
c)Briefly explain exception handling mechanism.   [4M]

OR

Q. No. 10 a)Explain class templates with multiple parameters.   [5M]
b) Clearly describe Rethrowing an exception.   [5M]
c)Explain member function templates .   [4M]

Time: 3 hours   BASIC ELECTRICAL ENGINEERING (R18A0201)   Max Marks: 70

BRANCH: B.TECH I - II (MECH,ANE)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 a) Classify and explain the different types of energy sources   [2+5M]

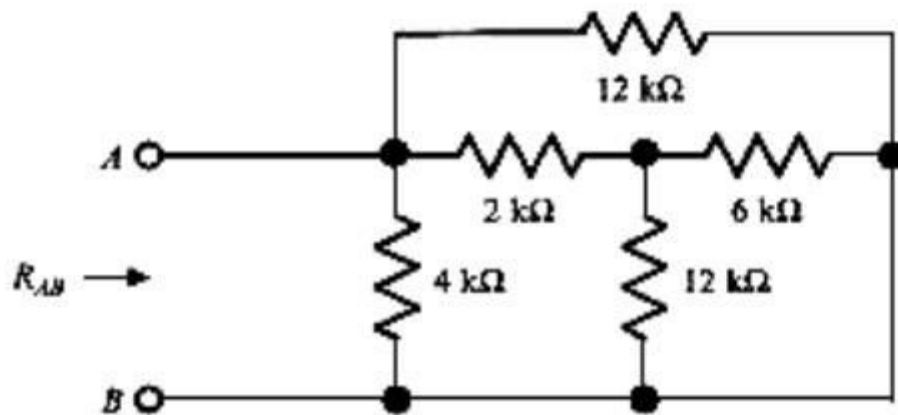b) Find the equivalent resistance across the terminals A-B as shown in Figure 1.   [7M]

Figure: 1

OR

Q.NO: 2 a) Explain KCL ,KVL and ohms law   [7M]

b)A 20Ω resistor is in series with a parallel combination of two resistors 30Ω and 10Ω. If the current in the 10Ω resistor is 6A, what is the total power dissipated in the three resistors?   [7M]
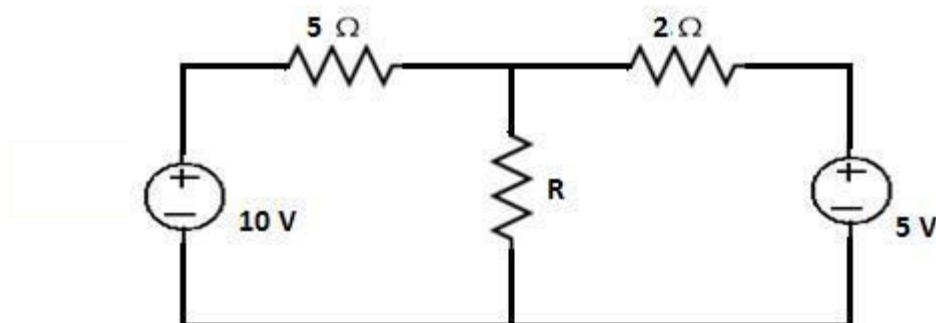
SECTION II

Q.NO: 3 a) Write short notes on Star – Delta transformation.   [7M]

b) With an example, explain in detail about Nodal analysis.   [7M]
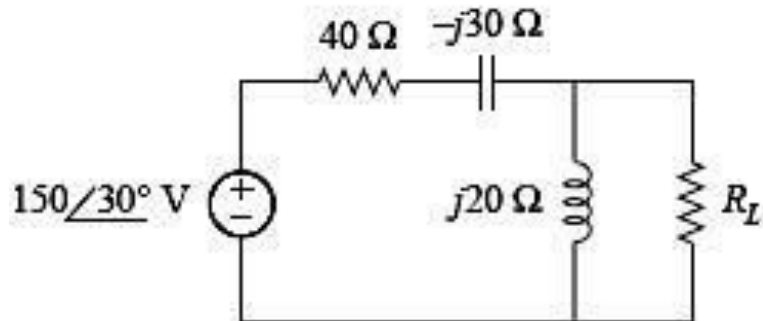
OR

Q.NO: 4 a) Using maximum power transfer theorem, determine the maximum power that is delivered to the unknown resistor R in the circuit below.   [7M]

b) Determine current flowing through 3ohms resistor using Super mesh analysis. [7M]

SECTION III

Q.NO: 5 a) Find the value of RL that will absorb the maximum average power for the circuit
shown in Figure. Calculate that power. [7M]

b)Discuss about the steady state analysis of series RLC circuits with required phasor
diagrams [7M]

OR
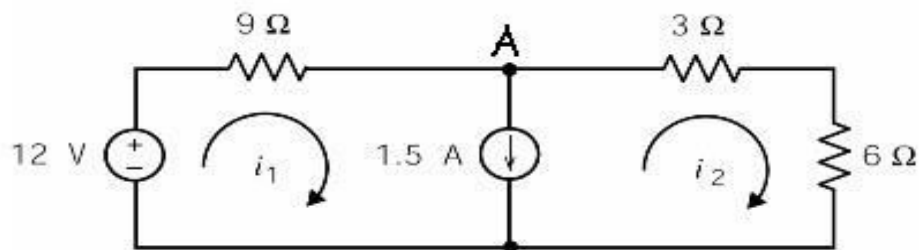
Q.NO: 6 a) Illustrate following terms:
i) Impedance ii) Reactance iii) Phase deference iv)Power factor. [7M]
b) Explain the behavior of AC through:
a)Pure R
b)Pure L
c)Pure C circuits.
For each case, derive the instantaneous value of V and I, Impedance, Average power,
Power factor, Instantaneous power and the relevant phasors. [7M]
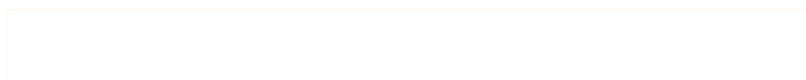
SECTION IV

Q.NO: 7 a) Explain the construction and working principle of single phase transformer with suitable sketches [14 M]

OR

Q.NO:8 a) Derive the EMF equation of a DC Machine [7M]

b) Define back emf and elaborate the operating principle of DC motor with their characteristics curve [7M]

SECTION V

Q.NO: 9a) With a neat schematic diagram. Dissect the function of Switch Fuse Unit (SFU), MCB, ELCB, MCCB in detail [14 M]

OR

Q.NO: 10 a) Relate Earthing. Explain the different types of batteries with their Characteristics [14 M]

Time: 3 hours   BASIC ELECTRICAL ENGINEERING (R18A0201)   **Max Marks: 70**

BRANCH: B.TECH I - II (MECH,ANE)

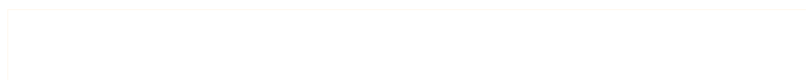Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 a) Explain independent and dependent sources with neat sketch   [7M]

   b) State & Explain Kirchhoff's laws with example.   [7M]

OR

Q.NO: 2 a) Write about source transformation with neat diagrams   [7M]

   b) (i) Classify the types of Network Elements

   (ii) Four lamps are connected to a 100 V supply. The current taken by the first three lamps are 1.9 A, 1.3A, 0.7 A. If the total supply is 5A calculate the resistance of all the lamps.   [4+3M]

SECTION II

Q.NO:3 a)Find the branch currents as shown in following figure by using the concept of tie-set matrix. (mesh anaiysis)   [7M]
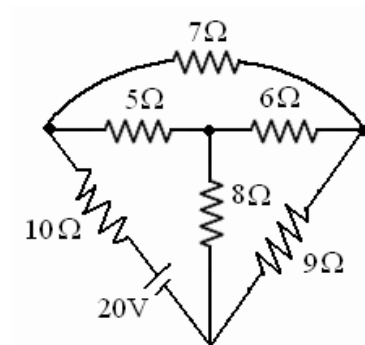
   b) Discuss and analyze the delta to star transformation for resistive networks   [7M]

OR

Q.NO: 4 a) State and explain super position theorem.   [7M]

   b)Determine the current I in the network by using Thevenin's theorem (Figure 1) [7M]
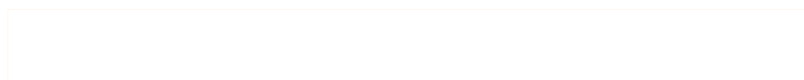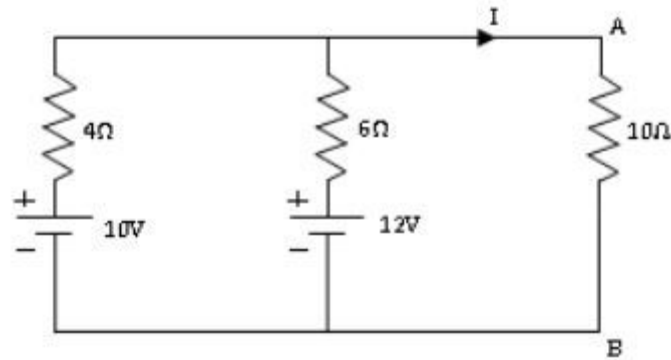
Figure: 1

SECTION III

Q.NO: 5 a)Define Average value, RMS value, Form Factor and Peak Factor for the following
Waveform   [7M]
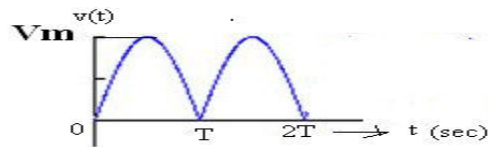
b)Find the impedance of series R-L-C circuit with R=100Ω, XL=50Ω and XC=20Ω   [7M]

OR

Q.NO:6 a) Draw the admittance locus diagram of series RC circuit and explain.   [7M]

b) A 20 Ω resistance and 30mH inductance are connected in series and the circuit is
fed from a 230V, 50Hz, AC supply. Find

a) Reactance across the inductance, impedance, admittance, current.

b)Voltage across the resistance.

c) Voltage across the inductance.

d) Reactive and Active powers.

e) Power Factor.   [7M]

SECTION IV

Q.NO: 7 a)Explain the construction features of single phase transformer with applications[7M]

b) Enumerate an expression to determine the EMF induced in a transformer.   [7M]

OR

Q.NO: 8 a) Derive the Torque equation of a DC motor   [7M]

b) Explain the working principle of DC generator with suitable sketches   [7M]

SECTION V

Q.NO: 9 a) Dissect the operation of MCB and ELCB with suitable sketches.   [7M]

b) Classify the Types of wires and cables used in electrical installations   [7M]

OR

Q.NO: 10 a) Define Earthing. Explain the different types of batteries with their characteristics
[7M]

b) Write a short note on the methods to calculate the energy consumption.   [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper

Time: 3 hours   BASIC ELECTRICAL ENGINEERING (R18A0201)   Max Marks: 70
BRANCH: B.TECH I - II (MECH,ANE)

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

SECTION-I

Q.NO: 1 a)Explain the various types of network elements   [7M]

   b) Discuss about the independent and dependent sources with illustrations   [7M]

OR

Q.NO: 2 a) State & Explain Kirchhoff's laws with example.   [7M]

   b) Explain about source transformation technique with neat diagrams.   [7M]

SECTION II

Q.NO:3 a)Find out the power absorbed by the 5 ohm resistor by using nodal analysis.   [7M]
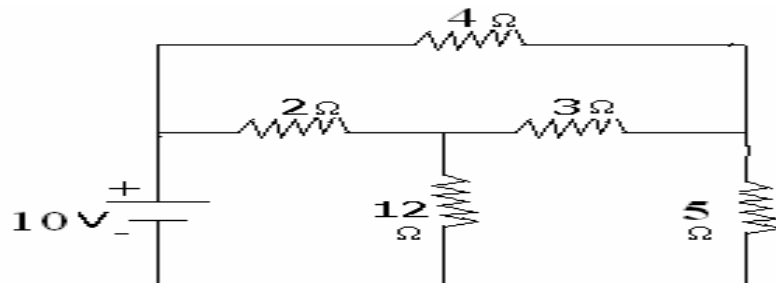
   b) Find the current supplied by 10 V battery by using Star – Delta transformation for the following network.   [7M]

(OR)
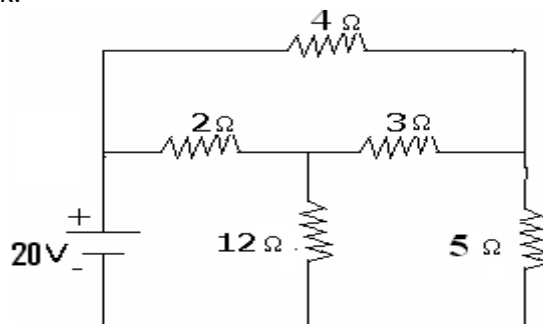
Q.NO: 4 a) State and explain Norton's theorem   [7M]

b) Determine the current flowing through the 5 ohm resistor using Thevenin's theorem. [7M]
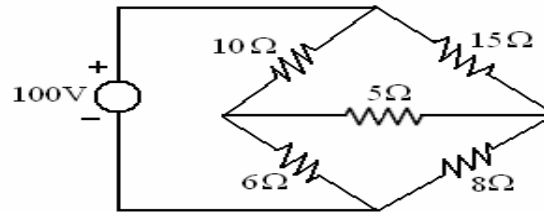
SECTION III

Q.NO: 5 a) Explain in detail about different representations of sinusoidal quantiti [7M]

b) A series combination of resistance of 100Ω and a coil with inductance 0.5 H and winding resistance 50Ω and a capacitor of 0.36 µF is connected to an AC supply with internal resistance 50Ω. Find the resonant frequency and quality factor. [7M]

OR

Q.NO: 6 a) Draw and explain the impedance and impedance triangle diagram of A.C series RL circuit [7M]

b) Dissect the polar and rectangular co-ordinate system using phasor diagram [7M]

SECTION IV

Q.NO: 7 a) Explain the construction and operation of single phase transformer with suitable sketches. [14 M]

OR

Q.NO: 8 a) With a neat diagram, explain the construction and working principle of DC generator with suitable characteristics [8M]

b) Derive an expression to determine the induced EMF in a DC machine. [6M]

SECTION V

Q.NO: 9 a) List out and explain the components involved in the LT switch gear with required diagrams. [10M]
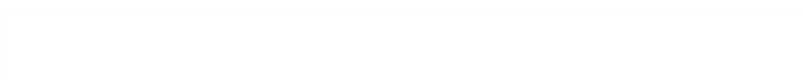
b) Justify the need of earthing used in electrical installations [4M]

OR

Q.NO: 10 a) Explain the different types of batteries with their characteristics [7M]

b)Write a short note on the methods of battery backup. [7M]
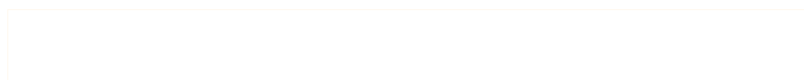
MODEL QUESTION PAPERS

II Year B. Tech – I Semester (III Semester)

S.NO	SUBJECT CODE	SUBJECT
1	R18A0023	Mathematics – III
2	R18A0401	Electronic Devices And Circuits
3	R18A0202	Electrical Circuit Analysis
4	R18A0203	Electrical Machines-I
5	R18A0462	Digital Electronics
6	R18A0366	Basic Mechanical Engineering

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper I -2018
MATHEMATICS-III

Time: 3 hours   **Max Marks: 70**
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1. Find the Fourier expansions of f(x) = xcosx; $0<x<2\pi$.   [14M]

OR

2. a) Find the Fourier series of periodicity of $f(x) = 2x - x^2$, $in\ 0 < x < 3$. [7M]
 b) Expand the function f(x) = x as a Fourier series in (-π,π).   [7M]

SECTION-II

3. Using Fourier integrals show that $e^{-ax} - e^{-bx} = \frac{2(b^2-a^2)}{\pi}\int_0^\infty \frac{\lambda \sin \lambda x}{(\lambda^2+a^2)(\lambda^2+b^2)}d\lambda, a > 0, b > 0$

OR

4. Find the finite Fourier sine and cosine transform of f(x), defined by f(x)=2x, where $0 < x < 2\pi$
                                                                            [14M]
SECTION-III
5. Show That the function is defined by $f(z) = \frac{x^3(1+i)-y^3(1-i)}{x^2+y^2}$ at $z \neq 0$, and f(0) = 0 is continuous and satisfies C-R equations at the origin but $f'(0)$ does not exist.[14M]
                                OR
6. a. Evaluate $\oint \frac{z-1}{(z+1)^2(z-2)} dz$ where$c: |z-i| = 2$ by Cauchy's Integral Formula.[7M]
b. Evaluate $\int_C \frac{z+4}{z^2+2z+5} dz$, where$c: |z + 1 - i| = 2$.   [7M]
SECTION-IV

7. a. Define (i) Removable singularity, (ii) Essential singularity, (iii) Pole Singularity.[6M]
b. Find the Laurent's Series of $f(z) = \frac{z^2-6z-1}{(z-1)(z-3)(z+2)}$ in the region$3 < |z + 2| < 5$.[8M]
                                OR
8. a. Evaluate by Residue Theorem $\int_C \frac{z-1}{(z+1)^2(z-2)} dz$, where$c: |z - i| = 2$.[7M]
b. Evaluate $\int_0^{2\pi} \frac{d\theta}{5-3Cos\theta}$ by Contour Integration.   [7M]
SECTION-V
9. Find and plot the image of the regions (i) $x > 1$ (ii) $y > 0$ (iii) $0 < y < \frac{1}{2}$ [14M]
 Under the transformation $w = \frac{1}{z}$.

                                OR
10. a. Find the Fixed Points of the Transformation.
     (i). $w = \frac{2i-6z}{iz-3}$ (ii). $w = \frac{6z-9}{z}$ (iii). $w = \frac{z-1}{z+1}$ (iv). $w = \frac{2z-5}{z+4}$.   [7M]
b. Define Bilinear Transformation and Show That Every Bilinear Transformation
 is Conformal.   [7M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper II -2018

MATHEMATICS-III

TIME: 3hours   **Max. Marks: 70**
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1. Find the half – range cosine series for the function $f(x) = (x-1)^2$ in the interval $0 < x < 1$ and

Show that $\sum_{n=1}^{\infty} \dfrac{1}{(2n-1)^2} = \dfrac{\pi^2}{8}$ [14M]

OR

2. Expand $f(x) = e^x, -\pi < x < \pi$ as a Fourier series. Derive a series for $\dfrac{\pi}{sinh\pi}$ [14M]

SECTION-II

3. Find the Fourier sine transform of $\dfrac{x}{a^2+x^2}$ and Fourier cosine transform of $\dfrac{1}{a^2+x^2}$ [14M]

OR

4. Find Fourier sine and cosine transforms $f(x) = \dfrac{e^{-ax}}{x}$ and deduce that   [14M]

$$\int_0^\infty \dfrac{e^{-ax} - e^{-bx}}{x} \sin sx \, dx = \tan^{-1}\left(\dfrac{s}{a}\right) - \tan^{-1}\left(\dfrac{s}{b}\right)$$

SECTION-III

5. a. Evaluate $\int_C \dfrac{z+4}{z^2+2z+5} dz, where c: |z + 1 - i| = 2.$ [7M]

   b. Find the analytic function whose real part is $e^{2x}(xCos2y - ySin2y)$.   [7M]

OR

6. State and Prove Cauchy's Integral Formula.   [14M]

SECTION-IV

7. a. Find the Laurent's Series of $\dfrac{1}{z^2-4z+3}$ for $1 < |z| < 3$.   [7M]
   b. Find the Taylor's Series of e^z about $z = 3$.   [7M]

OR

8. Evaluate $\int_C \dfrac{z-3}{z^2+2z+5} dz$, where c is the Circle given by   [14M]
   (i).$|z| = 1$, (ii). $|z + 1 - i| = 2$, (iii). $|z + 1 + i| = 2$

SECTION-V

9. a. Find the Bilinear Transformation which maps the points (0, 1, i) into the points (1+i,-i,2-i).   [10M]
   b. Write Cross-Ratio of four points z_1, z_2, z_3, z_4.   [4M]

OR

10. a.Show that the function $w = \dfrac{4}{z}$ transforms the straight line x = c in the z – plane into a circle in the w-plane   [10M]
    b.Define Critical Point and Bilinear Transformation   [4M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper III -2018
MATHEMATICS-III

Time: 3 hours   **Max Marks: 70**
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1.Find the Fourier series of period 2π for the function $f(x) = x^2 - x \ in \ (-\pi, \pi)$.

Hence deduce the sum of the series $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + ----= \frac{\pi^2}{6}$ [14M]

OR

2.a)Obtain sine series for $f(x) = \pi x - x^2$, in 0<x<π.   [7M]

 b). Obtain fourier series for the function $f(x) = x \sin x$ in $(-\pi, \pi)$ [7M]

SECTION-II

3.Using Fourier Integral, show that $\int_0^\infty \frac{1-\cos \lambda \pi}{\lambda} . \sin \lambda x \, d\lambda = \begin{cases} \frac{\pi}{2} \, if \, 0 < x < \pi \\ 0, if \, x > \pi \end{cases}$

[14M]

OR

4.Find the Fourier transform of f(x) = $\begin{cases} a^2 - x^2, if |x| < a \\ 0, if |x| > a > 0 \end{cases}$ Hence show that $\int_0^\infty \frac{\sin x - \cos x}{x^3} dx = \frac{\pi}{4}$

[14M]

SECTION-III

5 a. Find analytical function whose real part is $r^2 Cos2\theta + rSin2\theta$.   [7M]

b. If f(z) is an analytic function of z, prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) |f(z)|^2 = 4|f^1(z)|^2$.[7M]

OR

6 a. Evaluate $\int_C \frac{z^2 - z + 1}{z - 1} dz, \ where \ c: |z| = \frac{1}{2}$.   [7M]

b. Evaluate $\int_C \frac{logz}{(z-1)^3} dz, \ where \ c: |z - 1| = \frac{1}{2}$ using Cauchy's Integral Formula.[7M]

SECTION-IV

7.a. Expand $\frac{7z-2}{(z+1)z(z-2)}$ about the point z = -1 in the region $1 < |z + 1| < 3$ as Laurent's Series

[7M]

b. Expand f(z) = Cosz in Taylor's Series about $z = \frac{\pi}{4}$.   [7M]

OR

8. a. State and Prove Cauchy's Residue Theorem   [7M]

b. Evaluate $\int_{-\infty}^\infty \frac{x^2}{(1+x^2)(x^2+4)} dx$.   [7M]

SECTION-V

9. a. Show that the function $w = \frac{4}{z}$ Transforms the line x = c in the z- plane into a Circle   in the w- plane.   [7M]

b. Under the Transformation $w = \frac{z-i}{1-iz}$ find the image of the Circle

   (i). $|w| = 1$, (ii). $|z| = 1$.   [7M]

OR

10. Find the Bilinear Transformation which maps $1 + i$, $-i$, $2 - i$ of the z- plane into the points 0, 1, i respectively of the w-plane. Find the Fixed and Critical Points of this Transformation.

[14M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper I -2018
ELECTRONIC DEVICES AND CIRCUITS
(Common to EEE, ECE, CSE, IT)

Time: 3hours   **Max. Marks:70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I
1a. Draw the V-I characteristics of a diode with zero cut-in voltage and equivalent resistance of 100Ω. Draw the load line if RL is also 100 Ω.   [7]
1b. Explain V-I characteristics of pn junction Diode.   [7]
                                                    (OR)
2a. Draw and explain the circuit diagram of full-wave rectifier with capacitor filter. Derive the Ripple factor equation.   [7]
2b. Derive expressions for ripple factor, regulation and rectification efficiency of aCenter tapped Transformer Full wave rectifier.   [7]

SECTION-II
3. Draw a Self bias circuit and explain its operation. Calculate the Stability factor S   [14]
                                                    (OR)
4. what is a load line? Explainitssignificance.   [7]
     Find the Q-point of self-bias transistor circuit with the following specifications: V_{CC} = 22.5V, R_L = 5.6kΩ, R_C = 1kΩ, R_I = 90kΩ, R_2 = 10kΩ, V_{BE} = 0.7V and β = 55. Assume $I_B >> I_{CO}$ [7]

SECTION-III
5a. Compare the three transistor amplifier configurations with related to A_i, A_v, Ri & R_o

5b. For the emitter follower with Rs = 0.5K, R_L = 50K, h_{fe}= -50, h_{ie}= 1K, h_{oe} = 25μA/V, h_{re}=2.5×10^{-4}Calculate A_i, A_v, Ri & R_o

                                                    (OR)
6.   Explain thermal runway and thermal stability   [14]

SECTION-IV
7.   Explain the construction and principle of operation of Depletion type N-Channel MOSFET
                                                                                                  [14]
                                                    (OR)
8.   With the help of neat sketches and characteristic curves explain the construction & operation of a JFET and mark the regions of operation on the characteristics   [14]

SECTION-V
9 a.   Explain principal operation of Tunnel diode.   [7]
9 b.   Draw and Explain FET common source amplifier   [7]
                                                    (OR)
10a.   Explain the working of S.C. R   [7]
10b.   Explain working of photo diode   [7]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper II -2018
ELECTRONIC DEVICES AND CIRCUITS
(Common to EEE, ECE, CSE, IT)

Time: 3hours   Max. Marks:70

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1a.   Derive the equation for diffusion capacitance of a PN junction diode.   [7]
1b.   Explain different breakdown mechanisms in PN junction diode .   [7]
(OR)
2a.   A Full wave single phase rectifier makes use of 2 diodes, the internal forward resistance of each is considered to beconstant and equal to 30Ω. The load resistance is 1KΩ. The transformer secondary voltage is 200-0-200V (rms).Calculate VDC, IDC, Ripple factor[7]
2b.   Derive expression for FWR Rectifier i) DC load current ii) DC outputvoltage
        iii) Peak Inverse Voltage of each diode IV) Efficiency v)Ripplefactor   [7]

SECTION-II

3a.   Draw the circuit diagram of a transistor in CE configuration and explain the output characteristics with the help ofdifferentregions.   [7]
3b.   Explain compensation techniques   [7]
(OR)
4.   Draw a collector to base bias circuit and explain its operation. Calculate the Stability factor S, S', S''   [14]

SECTION-III

5.   Compare the three transistor amplifier configurations with related to A_I, A , R & Ro[14]
(OR)
6.   Explain thermal runway and thermal stability   [14]

SECTION-IV

7a.   The field effect transistor is called a voltage-sensitive electronic control device.
         Explain   [7]
7b.   Explain V-I characteristics of JFET   [7]
(OR)
8a.   Explain the construction and principle of operation of Enhancement mode N-channel MOSFET.   [7]
8b.   Compare BJT &FET   [7]

SECTION-V

9a.   Draw and Explain FET Common source Amplifier   [7]
9b.   Explain working principal of PHOTO DIODE   [7]
(OR)
10.   Explain the working of Tunnel diode with help of energy band diagrams and Draw V-I Characteristics   [14]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper III -2018
ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE, ECE, CSE, IT)

Time: 3hours   **Max. Marks:70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I
1a.   Explain in detail, the reason for exponential rise in forward characteristic of a diode with suitable mathematicalexpression.   [7]
1b.   Explain and Derive expression fortransitioncapacitance?   [7]
                    (OR)
2a.   Explain Full wave bridge rectifier withneatdiagram?   [7]
2b.   Compare Half wave Full wave and bridge rectifier   [7]

SECTION-II
3a.   Draw and explain input-output characteristics of of CB configuration   [7]
3b.   Explain early effect and punch through effect   [7]
                    (OR)
4a.   Draw and explain fixed bias circuit, derive the stability factors S   [7]
4b.   Write a short notes on compensation techniques   [7]

SECTION-III
5a.   Explain thermal runaway and derive the condition for thermal stability   [7]
5b.   Define the hybrid parameters for a basic transistor circuit and give CE hybrid model.
                                                                     [7]
                    (OR)
6a.   Summarize the salient features of the characteristics of BJT operatives in CE, CB and CC configurations?   [7]
6b.   Calculate the collector current and emitter current for a transistorwith $\alpha_{D.C.} = 0.99$ and $I_{CBO} = 20\mu A$ when the base current is$50\mu A$.   [7]

SECTION-IV
7a.   Explain principle of operation JFET and draw the V-I characteristics   [7]
7b.   Explain how FET act as voltage variable resistor   [7]
                    (OR)

8a.   Compare Depletion MOSFET andenhancementMOSFET   [7]
8b.   Compare JFET and MOSFET   [7]

SECTION-V

9a.   Draw the FET self-biasing circuit   [7]
9b.   Explain FET common drain amplifier   [7]
                    (OR)
10.   With neat energy band diagrams, explain the V-I characteristics of Tunnel diode indetail. Also explain the negative-resistance region in the characteristics and applications of Tunneldiode.   [14]

UG Model question paper-I
ELECTRICAL CIRCUIT ANALYSIS
EEEII YEARI SEMESER

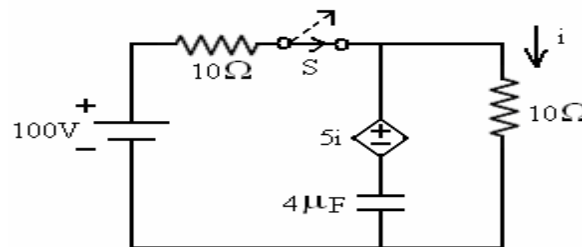**Time: 3 hours**   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing
onequestion from each section and each question carries 14 marks.

5*14=70M

SECTION-I

1. a) For the circuit shown below Figure, find the current equation when switch S is opened
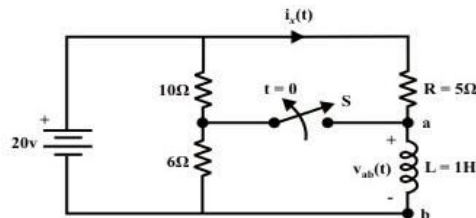at t = 0.   **[7M]**

b) Explain the DC response of series R-C circuit with neat waveforms. **[7M]**
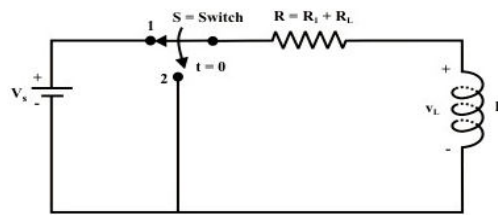
(OR)

2. a) In the given circuit the switch is opened at t=0.Find **[7M]**
   (i) $V_{ab}(0-)$
   (ii) $i_x(0-)$
   (iii) $i_x(0+)$
   (iv) $V_{ab}(0+)$
   (v) $i_x(t=\infty)$
   (vi) $i_x(t)$ for t>0.

b) In the given circuit the switch is shifted from position 1 to 2 at t=0.Determine i(t) for t>0.**[7M]**

SECTION-II

3. Explain the transient response in time domain with sinusoidal excitation as input for a RC circuit. Draw the voltage waveform across R and C.**[14M]**

(OR)

4. Explain the transient response in time domain with sinusoidal excitation as input for a RL circuit. Draw the voltage waveform across R and L.**[14M]**
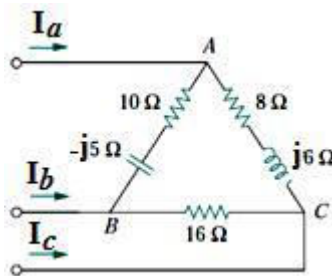
SECTION-III

5. a) A balanced delta-connected load has a phase current $I_{AC}= 10\angle- 30^0$ A:**[7M]**
   i) Determine the three line currents assuming that the circuit operates in the positive phase sequence.
   ii) Calculate the load impedance if the line voltage is $V_{AB}= 110\angle0^0$ V.

   b) A balanced star-connected load absorbs a total power of 5 KW at a leading power factor of 0.6 when connected to a line voltage of 240 V. Find the impedance of each phase and total complex power of load.**[7M]**

6.a)The unbalanced -load as shown in Figure 4 below is supplied by balanced voltages of
        200V in the positive sequence. Find the line currents. Take $\mathbf{V}_{ab}$ as reference.
[7M]

b) Prove that two watt-meters are sufficient to measure power in three phase system.**[7M]**

SECTION-IV

7. Explain about Series Resonance in detail along with quality factor and band width.**[14M]**

(OR)

8. Draw the locus diagram of series R-L circuit and R-C circuit when R is variable.**[14M]**

SECTION-V

9. For the network shown below figure, 'S' is switched on at t=0. Find the driving point impedance and source current in s-domain.**[14M]**
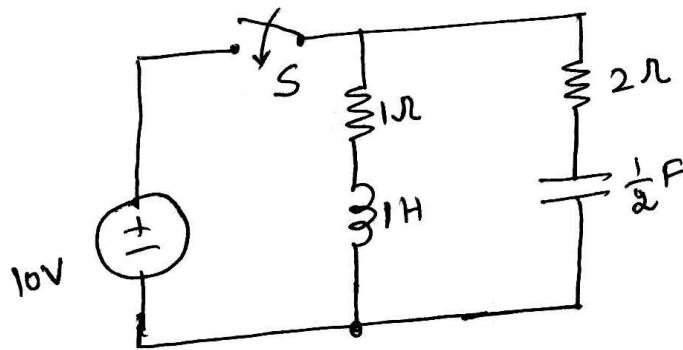
(OR)

10. a) List the necessary conditions for transfer functions.**[7M]**

b) Find the pole zero locations of the current transfer ratio I_2 / I_1 in s- domain for circuit **[7M]**

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing onequestion from each section and each question carries 14 marks.

                                                     5*14=70M

SECTION-I

1. a)   The switch in the figure has been in position *a* for a long time, At $t = 4$ s the switch is moved to position *b* and left there. Determine *v(t)* at $t = 10$ s.   **[7M]**
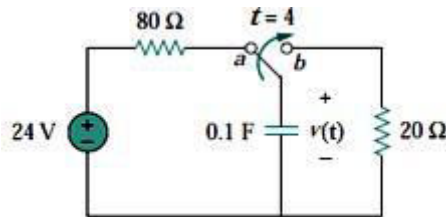
   b)   The switch in Figure was open for a long time but closed at t = 0. Determine:
     (i)   i(0+), v(0+),
     (ii)   (ii) i(∞), v(∞).   **[7M]**
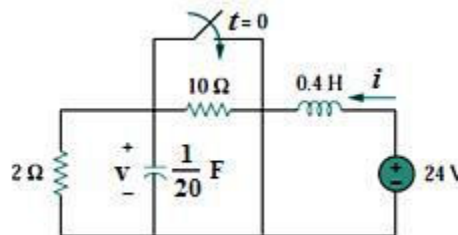
(OR)

2.a)   The switch in figure has been in position A for a long time. At t = 0,the switch moves to B. Determine V(t) for t > 0 and calculate its value at t = 1 s and 4 s.**[7M]**

b)   At t = 0, switch 1 in Figure 8 is closed, and switch 2 is closed 4 s later. Find i(t)
     for t > 0. Calculate i for t = 2 s and t = 5 s.   **[7M]**

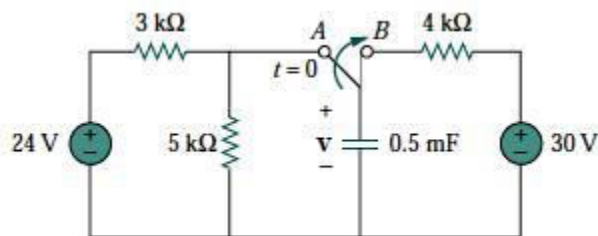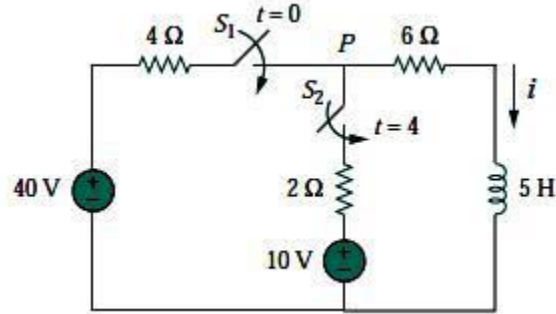## SECTION-II

3. Derive the expression for the current in a series RL circuit (R = 10Ω, L = 10 mH) excited by a sinusoidal voltage of 100V, 50 Hz if the supply is connected at t = 0. Assume zero initial conditions. **[14M]**

(OR)

4. Derive the expression for the voltage across the capacitor in a series RLC circuit (R = 5Ω, L = 5 mH, C = 5µF) excited by a sinusoidal voltage of 100V, 50 Hz if the supply is connected at t= 0. Assume zero initial conditions.   **[14M]**

SECTION-III

5.a)Three impedances each of (10+j3) ohms are connected in star to a 220 V, 3-phase,50 Hz supply. Calculate the line currents and power delivered to the load.**[7M]**

b) Derive the relation between phase and line values of a 3-phase balanced delta connected system.   **[7M]**

(OR)

6.a)Explain the measurement of power in a balanced 3-phase system using a single watt meter.**[7M]**
   b) Three coils each having a resistance of 50 Ω and an inductive reactance of 45 Ω are connected in star and fed by a 3-phase, 400 V, 50 Hz system. Find
       i) Line current
       ii) Power
  iii) Power factor   **[7M]**

SECTION-IV

7.Explain about Parallel Resonance in detail along with quality factor and band width.**[14M]**

(OR)

8. Draw and explain about the locus diagram of parallel R-C circuit and R-L circuit when R is variable.   [14M]

SECTION-V

9. a)   Explain the concept of Complex Frequency.[7M]

   b) Find the Transfer Impedance function for the network given below.[7M]
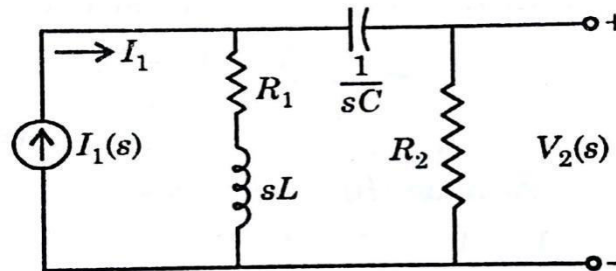
(OR)

10)   Find the Driving Point Impedance, Transfer Impedance and Voltage Transfer Function for the circuit given below.   [14M]
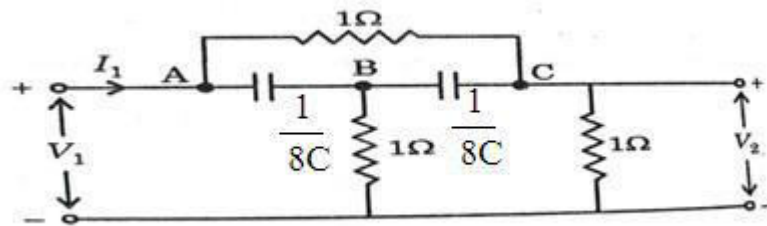
Time: 3 hours   Max Marks: 70

Note: This question paper contains of 5 sections. Answer five questions, choosing onequestion from each section and each question carries 14 marks.

5*14=70M

SECTION-I

1 a) In the circuit shown figure, the capacitor voltage just before t = 0 is   **[7M]**
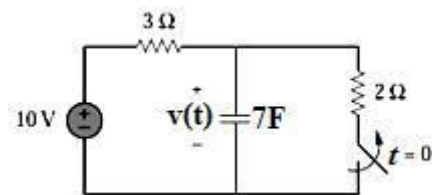
b)   The switch in the figure 3 has been open for a long time. It is open at $t = 0$, the**[7M]**

value of v(∞).

(OR)

2.   a) Deduce the transient response of RL series circuit excited by DC source.**[7M]**

b) In the network shown in the figure below, the switch is closed at t = 0. Find the**[7M]**
values of i1(t) and i2(t) assuming zero initial currents through inductors.
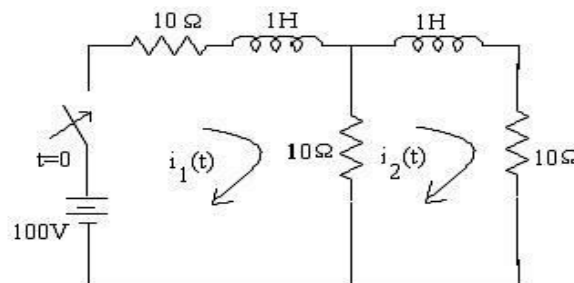
SECTION-II

3. What is damping ratio? Derive the time constant for a parallel RC circuit excited by AC supply. **[14M]**

(OR)

4. What is the condition for the response of a series RLC circuit excited by DC supply to have critically damped response? **[14M]**

SECTION-III

5. a) Two watt meters connected to a 3- phase motor indicate the total power input to be 12 kW. The power factor is 0.6. Determine the readings of each wattmeter.**[7M]**

b) If V_{ab}= 240 V $\angle$ 15^0 for the circuit shown figure 1 below, what is the value of I_{ab}. **[7M]**

(OR)
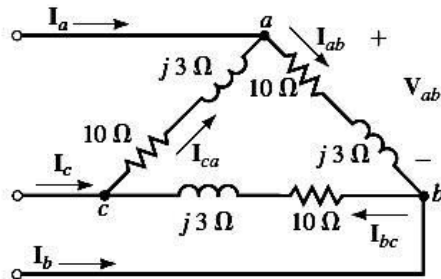
6. a) Explain about three phase system? List out the merits of three phase system.**[7M]**

b) Three coils, each having resistance of 25Ω and inductive reactance of 10Ω are connected in Star to a 400V, 3-phase, 50Hz AC supply. Calculate the power supplied.**[7M]**

SECTION-IV

7. Explain about Series and Parallel Resonance in detail along with quality factor and bandwidth. **[14M]**

(OR)

8. Draw and explain about the locus diagram of Series R-C circuit and R-L circuit when X_L is variable. **[14M]**

SECTION-V

9. What is the driving point and transfer impedance of the network shown figure below?**[14M]**
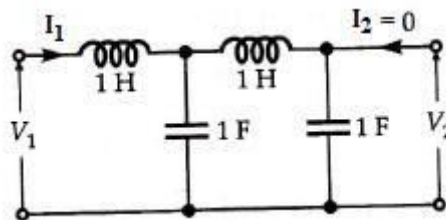
(OR)

10. Find the expression for voltage transformation ratio for the network shown in figure

[14M]
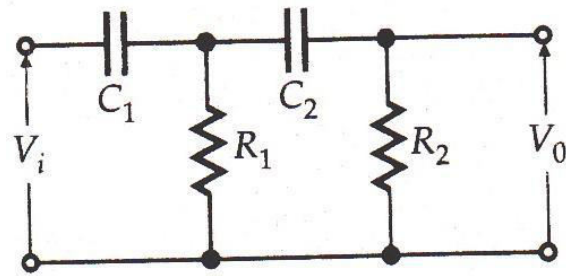
Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.
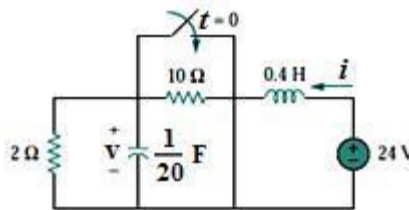
Section-I

1 a) Describe the principle of energy conversion and apply it to an electric motor as electro mechanical conversion device.   [7M]
  b) All energy conversion devices use magnetic field as a coupling medium rather than electrical field. Explain why?   [7M]

OR

2a) Draw and explain with block diagram, the various energies involved in an electro mechanical energy conversion device.   [7M]
  b) Show that the reaction of coupling magnetic field on the electrical or mechanical system is essential for the electromechanical energy conversion process.   [7M]

Section-II

3 a) Explain the basic principle of operation of a D.C. generator   [7M]
   b) With neat diagram give the constructional features of D.C. machine.   [7M]

OR

4a) Describe the constructional details of the armature of a D.C. machine giving suitable diagrams.   [7M]
  b) Give the materials and functions of the following parts of a D.C. machine. (i) Field poles, (ii) Yoke, (iii) Commutator, (iv) Commutating poles and (v) Armature.   [7M]

Section-III

5a) Draw the schematic diagram of separately excited D.C. generator. Also write the current and voltage equations.   [7M]
 b) Draw the schematic diagram of D.C. series generator. Also write the current and voltage equation.   [7M]

OR

6a) In a 110 V D.C. compound generator, the resistance of the armature, shunt field and series field are 0.06 Ω, 25 Ω and 0.04 Ω respectively. The load consists of 200 lamps each rated at 55 W, 110V. Find the total emf. generated and the armature current when the machine is connected in, (a) Long shunt and (b) Short shunt.   [7M]

b) Draw the schematic diagram of D.C. short shunt generator and also write the current and voltage equation. [7M]

Section-IV

7a) Write the principle of working of D.C. motor [7M]
b) A 250 V D.C. motor takes 41 amps at full load. Its armature and shunt field resistance are 0.1 Ω and 250 Ω. Find back emf. On full load. [7M]

OR

8 a) Draw the schematic diagram of D.C. series motor. Also write the back emf. Current and voltage equations. [7M]
b) A D.C. series motor working on 200 V supply draws a current of 50 A, its armature and series field resistance are 0.03 Ω and 0.02 Ω respectively. Calculate back emf. [7M]

Section-V

9 a) List the different methods of speed control of D.C. shunt motor. [7M]
b) In a Hopkinson's test on 220 V, 100 kW generators the circulating current is equal to the full load current and in addition, 90 A are taken from the supply. Obtain the efficiency of each machine. [7M]

OR

10 a) what is Swinburne's test? List the advantages and the disadvantages of Swinburne's test Conducted on D.C. motor. [7M]

b) Write about Hopkinson's test and give its limitations. What are the advantages of Hopkinson's test?

Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1a) Derive expression for the magnetic force developed in linear electromagnetic system. [7M]
b) What is the expression for electromagnetic torque develop in a linear electromagnetic
system?   [7M]

OR

2 a) what is energy balance equation? Explain the importance of it in electromechanical
energy conversion devices.   [7M]
  b) Give applications of singly excited system and explain their working.   [7M]

Section-II

3 a) Derive the EMF equation of a D.C. generator.   [7M]
  b) An 8-pole D.C. generator has per pole flux of 40 m wb and winding is connected in lap
with 960 conductors. Calculate the generated emf. on open circuit when it runs at 400 r.p.m.
If the armature if wave wound at what speed must the machine be driven to generate the
same voltage.

OR

4a) the armature of a 6-pole generator has a wave winding containing 664 conductors. Calculate
the generated emf. When flux per pole is 60 m wb and the speed is 250 r.p.m. Find the speed at
which the armature must be driven to generate an emf. of 550 V if the flux per pole is reduced to
58 m wb.   [7M]
b) Derive the expression for calculating the demagnetizing and cross magnetizing ampere turns per
pole in a D.C. generator with usual notation.   [7M]

Section-III

5a) Draw the external and internal characteristics of a separately excited D.C. generator[7M]
  b) What is critical speed? Explain the significance of critical speed   [7M]

OR

6) In a 110 V compound generator, the resistance of the armature, shunt and series windings is
0.06, 25 and 0.04 Ω respectively. The load consists of 200 lamps each rated at 55 W, 110 V. Find
the emf. generated and armature current when the machine is connected, (a) Long shunt, (b)
Short shunt and (c) How will the ampere-turns of series winding be changed if in, (i) A diverter of
resistance Ω be connected in parallel with the series winding? Ignore armature reaction and

brush contact drop.   [14M]

Section-IV

7a) in a 4-pole lap wound D.C. compound motor develops back emf. of 200 V. The field produces a flux of 0.025 wb and the armature contains 400 conductors. Calculate the speed developed.
 b) Why is starter necessary for D.C. motor?   [7M]

OR

 8) A 4-pole, 500 V, shunt motor has a total of 720 armature conductors which are wave wound. The full-load armature current is 60 A, and the flux per pole is 0.03 m wb. The armature resistance is Ω. The voltage drop across a brush is 1 volt. Calculate the full-load speed of the motor.   [14M]

Section-V

9 a) what are the different methods of speed control of a D.C. motor? Explain?   [7M]
b) Explain with neat diagram, how can you find efficiency of small D.C. motor with brake test. [7M]

OR

10) Describe a method of determining the efficiency of D.C. shunt motor at various loads, without actually putting the load on the motor. State the assumptions made in the method described.   [14M]

Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1a) with the help of neat diagram obtain the expression for the energy stored in a magnetic system for a simple attracted armature type relay. Explain the operation of system.   [7M]
 b) Explain the mechanical energy and work done in singly excited system when actual

displacement occurs.   [7M]

OR

2 a) Derive an expression for the mechanical force developed for singly excited magnetic field
system.   [7M]
  b) Define expressions of field energy and co-energy in a singly-excited electromechanical unit. [7M]

Section-II

3 a) what is armature reaction? Describe the effects of armature reaction on the operation of a D.C. machine. How the armature reaction is minimized.   [7M]
b) The armature of a 2-pole, 200 V generator has 400 conductors and runs at 300 r.p.m. Calculate the useful flux per pole. If the number of turns in each field coils is1200, what is the average value of the emf? induced in each coil on breaking the field, if the flux dies away completely in 0.1 ($\emptyset$ = 0.1 wb E_{ave} = 1200).   [7M]

OR

4 a) A 4-pole lap connected D.C. generator having 50 slots on its armature with 6 conductors per slot, the flux per pole 30 m wb and generates an open circuit voltage of 180 V (i) Find the speed at which the motor will run for the above condition, (ii) Keeping the speed constant, suggest a changein the armature of the generator such that the generator is capable to generate at no load a voltage of 90 V, with the same rated flux.   [7M]
b) What is the fundamental difference between a simple lap winding and a simplex wave winding?
Draw simple diagrams to show the above windings**.**   [7M]

Section-III

5 a) what are the requirements of voltage build up in self-excited D.C Generator. [7M]
b) Draw the load characteristics of shunt, series and compound generators. Describe these characteristics nature and applications.   [7M]

OR

6 a) Mention the reasons for the compounding D.C. generator. Neatly sketch and explain the external characteristics of a D.C. compound generator.   [7M]
  b) Distinguish between internal and external characteristic of a D.C. generator. How can the internal characteristic are derived from the external characteristic of a separately excited generator.   [7M]

Section-IV

7 a) Explain the principle of operation of a D.C. motor. Derive the equation for thetorque developed by a D.C. motor.   [7M]
 b) A 12-pole lap connected 230 V shunt motor has 410 conductors. It takes 41 A on full-loads.

The flux per pole is 0.05 wb. The armature and field resistances are 0.1 Ω and 230 Ω respectively. Contact drop per brush is 1 V. Determine the speed of motor at full load Why is starter necessary for D.C. motor. [7M]

OR

8 a) Why the emf. Induced in D.C. motor is called as back emf. and then explains principle of operation of D.C. motor. [7M]

   b) Define Torque. Derive the expression for torque developed by a D.C. motor from fundamentals. [7M]

Section-V

9 a) How can you conduct the retardation test on D.C. shunt motors. [7M]

  b) Describe any one laboratory test procedure to separate the losses in a D.C. machine. [7M]

OR

10 a) Explain how rotational losses can be estimated using retardation test. [7M]

   b) What are the various methods of speed control of D.C. series motors? [7M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech II year – I Semester Examinations, Model Paper-I

DIGITAL ELECTRONICS

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1)   (a) Explain about the Binary Number System and how it is used in digital System   [7]
     (b) Explain the properties of X-OR Logic Gate   [7]

OR

2)   Draw the logic diagram using only two input NAND gate to implement the following expression
F= (AB+A'B')(CD'+C'D)   [14]

SECTION-II

3)   (a)Explain the postulates of Boolean Algebra   [7]
     (b) Explain the DeMorgans theorem with Examples   [7]

OR

4)   Using the maps method, simplify the following expression using sum of the product from.   [14]
a) (abc)'+a(bc)' +don't cares abc+a'bc'+a'b'c
b) Abc+(ab)'c +don't cares abc'+ab'c

SECTION-III

5)   a) Explain the designing procedure for combinational circuit   [8]

     b) Design a half Adder combinational circuit   [6]

OR

6)   Design and prove Full adder using two half adders   [14]

SECTION-IV

7)   Define Latch? Explain about Different types of Latches in detail?   [14]

OR

8)   Design JK Flip Flop using SR Flip Flop   [14]

SECTION-V

9)   Explain in detail about the PLD's   [14]

OR

10)   Draw the PLA circuit to implement the function   [14]
a) F_1=A'B+AC'+A'BC'
b) F_2=(AC+AB+BC)'

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
B.Tech II year – I Semester Examinations, Model Paper-II
DIGITAL ELECTRONICS

Time: 3 hours   Max Marks: 70

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1) (a) what is Number system explain about binary number System   [7]
   (b) What is logic Gate? Explain the different logic gates   [7]
                                      OR
2) Implement the function using NOR Gates $T(w,x,y,z)=\pi M(0,1,2,3,4,6,7,8,9,11,15)$ [14]

SECTION-II

3) (a) Expand A+BC'+ABD'+ABCD   [5]
   (b) Show (A+B')(B+C')(C+D')(D+A')=(A'+B)(B'+C)(C'+D)(D'+A)   [9]
                                      OR
4) For the function $T(w,x,y,z)=\sum(0,1,2,3,4,6,7,8,9,11,15)$
   a)   Find all prime implicants and indicate which are essential through the Kmap   [7]
   b)   Reduce using mapping the following expression and implement the real minimal expression
           in universal logic $F=\sum(0,2,4,6,7,8,10,12,13$ [7]

SECTION-III

5) (a) Implement Full adder using NAND gates   [7]
   (b) Implement full subtractor using NAND gates only.   [7]
                                      OR
6) (a) Design the 4 bit parallel adder/subtractor combinational circuit   [7]
   (b) Design 8:1 Multiplexer using 2:1 multiplexers   [7]

SECTION-IV

7) (a) Compare the combinational and sequential circuits   [7]
   (b) Explain the operation of SR flip flop   [7]
                                      OR
8) Design a synchronous mod 8 counter using clocked JK Flip Flop   [14]

SECTION-V

9) Explain about memory decoding?   [14]
                                      OR
10) Write a short note on   [14]
    a) Address and data bus
    b) Sequential memory
    c) RAM
    d) Cache memory

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
B.Tech II year – I Semester Examinations, Model Paper-III
DIGITAL ELECTRONICS

Time: 3 hours   Max Marks: 70

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1)
   a) 10101100111.0101 to Base 10   [2]
   b) $(153.513)10 = (\ )8$ [2]
   c) Given that $(292)10 = (1204)b$ determine `b'   [3]
   d) Implement the following function using NAND gates
      A'BC+A'B'C+ABC'+AB'C+A'BC'+A'B'C'   [7]
                                        OR
2) Implement the logic gates using Universal gates ?   [14]

SECTION-II
3) Simplifly the following functions and implement using logic gates   [14]
      F=abc'+ab'+a'c+a'b'c+ab'c
      F=∑m(0,2,4,6,7,8,10,12,13,15)
                                        OR

4) (a) Implement the following function using only NOR gates .F=a(b+cd)+bc'   [10]
      (b) What is don't care condition?   [4]
SECTION-III

5) Explain how you design a combinational circuit. Show a combinational circuit for a Binary multiplier   [14]
                                        OR
6) Design a combinational circuit of a magnitude comparator considering one example   [14]

SECTION-IV
7) (a) Write the excitation tables for SR,JK,D and T Flip Flop   [10]
      (b) What is a counter?   [4]
                                        OR
8) Design a synchronous mod 8 counter using clocked SR Flip Flop   [14]
SECTION-V
9) Implement the following functions using PAL   [14]
      a) F1=abc+a'b'c+abc'+ab'c'+ab'+a'bc
      b) F2= a'b'c'+a'b'c+ab'c'+a'bc
                                        OR
10) Explain about various memories?   [14]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper I -2018

Basic Mechanical Engineering
(Common to EEE, ECE, CSE, EIE, BME, IT, MCT, ETM, ECOMPE)

Time: 3 hours   **Max. Marks: 70**

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Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-1

1 a) Explain air standard Otto cycle with PV and TS diagram and write its efficiency? [7M]

b) Discuss about entropy and available energy?   [7M]

(OR)

2 a) Explain air standard Diesel cycle with PV and TS diagram and write its efficiency? [7M]

b) Explain the significance of Clausius inequality.   [7M]

SECTION-2

3 a) with the help of neat sketch, explain the working of four stroke SI engine?   [7M]

b) With a suitable sketch explain the working of a gas turbine.   [7M]

(OR)

4 a) Describe the working of reciprocating pump?   [7M]

b) With a neat sketch explain the working of centrifugal pump.   [7M]

SECTION-3

5 a) Explain working of vapour compression refrigeration system with neat sketches? [7M]

b) What is mean by COP and Efficiency?   [7M]

(OR)

6 a) Explain about the different refrigerants used and their impact on the environment.[7M]

b) With the help of psychometric chart explain various psychometric processes.   [7M]

SECTION-4

7a) How can you arrange gears for transmitting power from one shaft to another?   [7M]

 b) Discuss on CRDI and MPFI technology.   [7M

(OR)

8 a) Explain belt drives and types of belts used in belt drives?   [7M]

 b) Classify gears and gear trains?   [7M]

SECTION-5

9 a) Illustrate the working single plate clutch.   [7M]

 b) Write a short noteS on (1). Forging. (2) Rolling.   [7M]

(OR)

10 What is powder metallurgy? What are the basic steps of powder metallurgy?   [14M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper I -2018

Basic Mechanical Engineering

(Common to EEE, ECE, CSE, EIE, BME, IT, MCT, ETM, ECOMPE)

Time: 3 hours   **Max. Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-1

1 a) Explain two statements of second law of thermodynamics?   [7M]

  b) Discuss about entropy and available energy?   [7M]

(OR)

2 a) Explain about Carnot cycle with PV and TS diagram and write it efficiency? Write its limitations? [7M]

  b) Sketch a Brayton cycle and explain?   [7M]

SECTION-2

3 a) Discuss about hydraulic turbines and gas turbines?   [7M]

  b) Differentiate between fan ,blowers and compressors.   [7M]

(OR)

4 a) With the help of neat sketch, explain the working of four stroke SI engine   [7M]

  b) With the help of neat sketch, explain the working of four stroke CI engine   [7M]

SECTION-3

5 a) .Explain the working of vapour compression refrigeration system.   [7M]

  b) Explain about the different refrigerants used and their impact on the environment   [7M]

.

(OR)

6 a) With the help of psychometric chart explain various psychometric processes. [7M]

b) Discuss about window air conditioning? [7M]

SECTION-4

7 a) Classify gears and gear trains? [7M]

b) Illustrate the working principle in single plate clutch. [7M]

(OR)

8. What is powder metallurgy? What are the basic steps of powder metallurgy? [14M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year I Semester Examinations, Model Paper I -2018

Basic Mechanical Engineering
(Common to EEE, ECE, CSE, EIE, IT, MCT, ETM, ECOMPE)

Time: 3 hours   **Max. Marks: 70**
===

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-1

1) Explain air standard Diesel cycle with PV and TS diagram and derive its efficiency   [14M]
(OR)
2) Explain air standard Otto cycle with PV and TS diagram and derive its efficiency? [14M]

SECTION-2

3) Discuss about hydraulic turbines and gas turbines?   [14M]
(OR)
4) With the help of neat sketch, explain the working of four stroke CI engine   [14M]

SECTION-3

5) Explain working of vapour compression refrigeration system with neat sketches?[14M]

(OR)
6) With the help of psychometric chart explain various psychometric processes   [14M]

SECTION-4

7) How can you arrange gears for transmitting power from one shaft to another?   [14M]
(OR)
8) Explain with neat sketches on (1). Forging. (2) Rolling processes.   [14M]

SECTION-5

9) Explain different engineering materials with properties?   [14M]
(OR)
10) With the help of neat sketches, explain rolling and Forging process?   [14M]

II Year B. Tech – II Semester (IV Semester)

S.NO	SUBJECT CODE	SUBJECT
1	R18A0204	Electrical Machines -II
2	R18A0205	Power Systems-I
3	R18A0206	Electromagnetic Fields
4	R18A0406	Analog Circuits
5	R18A0061	Managerial Economics & Financial Analysis
6	**OE1**	**OPEN ELECTIVE 1**

OPEN ELECTIVE 1		
S.NO	SUBJECT CODE	SUBJECT
1	R18A0451	Digital Electronics
2	R18A0251	Elements of Electrical Engineering
3	**R18A0551**	**Database Systems**
4	R18A0351	Elements of Mechanical Engineering
5	R18A0352	Green Energy Systems
6	R18A0051	Intellectual Property Rights

R 18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
ELECTRICAL MACHINES – II
(Electrical and Electronics Engineering)

Time: 3 hours   **Max Marks: 70**

Note:.Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

_____

SECTION-I

1. a) Explain the working principle of transformer?
   b) Distinguish between step-up and step-down transformer.?

OR

2. a) Explain the effect of change in load on iron losses of transformer.?
   b) Define voltage regulation of a transformer.?

SECTION-II

3. a)How can we calculate the efficiency of a transformer using Sumpner's test?.
   b Define voltage regulation. How can we calculate voltage regulation using OC and SC tests?

OR

4. a) Define an Autotransformer and Draw the equivalent circuit of autotransformer?
   b) Write a short note on constant losses taking place in transformer.?

SECTION-III

5. a) Discuss the constructional details of the three-phase transformers with necessary diagrams.?
   b) List out the advantages and disadvantages of a bank of 3, 1-phase transformers to single 3-phase transformers.?

OR

6. Draw the connection diagram and Phasor diagram for the following three-phase connections:
(i) Y-Δ, (ii) Δ-Y and (iii) Δ-Δ. Also state their relative advantages and disadvantages.?

SECTION-IV

7. a) Write a short notes on squirrel cage induction motor and slip ring induction motor?
   b) Differentiate between concentrated winding and distributed winding.?

OR

8. a) Explain the principle of operation of a poly phase induction motor.?
   b) A 3-phase induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate,
            (i) Rotor frequency when rotor runs at 60 r.p.m.
            (ii) Rotor speed, when slip is 4% and Synchronous speed

SECTION-V

9. Write and explain the various starting methods of induction motor.?

OR

10.a) Explain the procedure of no-load and blocked rotor tests on a 3-phase induction motor?

b) Explain the following methods of speed control with slip-torque characteristics.

(i)Frequency control   (ii)Stator voltage control

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R 18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
ELECTRICAL MACHINES – II
(Electrical and Electronics Engineering)

Time: 3 hours   **Max Marks: 70**

Note: Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

_____

SECTION-I

1. a) Write a short note on all day efficiency of transformer?
   b) With neat phasor diagram explain the operation of transformer with capacitive load.?

OR

2. a) A 2, 200 / 200 V, transformer takes 1 A at the HT side on no-load at a p.f. of 0.385 lagging. Calculate the iron losses. If a load of 50 A at a power of 0.8 lagging is taken from the secondary of the transformer, calculate the actual primary current and its power factor.?
   b Give the constructional difference between a core type and shell type of transformers. How the iron losses are minimized?

SECTION-II

3. a)What are the condition for parallel operation of two transformers?
   b) Explain the working principle of Auto-transformer and give the constructional features for the same?

OR

4. a) The maximum efficiency of a 500 kVA, 3300 / 500 V, 50 Hz, single phase transformer is 97 % and occurs at 3/4th full load and unity power factor. If the impedance drop is 10 %, calculate the regulation at full-load and 0.8 p.f. lagging?
   b) Compare the results and procedure of O.C., S.C. tests and back to back tests conducted on transformer.?

SECTION-III

5. a)Describe four possible ways of connections of 3-phase transformers with relevant relations amongst voltages and currents on both HV and LV sides.?
   b) What is three winding transformer? What is the third winding called as? Why third winding is needed?

OR

6. a) Describe the principle of regulating the voltage with the help of tap-changers.?
   b) Explain the function of centre tapped reactor in on-load tap changer.?

SECTION-IV

7. a) Explain the production of torque in a 3-phase slip ring induction motor when the rotor is running with a slip (S).?

b) . A 4-pole, 50 Hz induction motor runs with a slip of 0.01 p.u. on full-load. Calculate the frequency of the rotor current.

(i) At standstill (ii) At full-load.

OR

8. a) Define slip and Discuss the variation of slip with load.?

b) Describe the methods to reduce the effect of crawling and cogging in an induction motor.

SECTION-V

9. a) Explain the procedure of no-load and blocked rotor tests on a 3-phase induction motor.?

b) Explain the procedure of drawing the circle diagram of an induction motor. What information can be drawn from the circle diagram?

OR

10. a) Explain DOL starter with neat sketch and obtain the expression for starting torque in terms of full load torque.?

b) Compare the speed control of 3-phase induction motor by rotor resistance control and variable frequency control.?

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R 18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
ELECTRICAL MACHINES – II
(Electrical and Electronics Engineering)

Time: 3 hours **Max Marks: 70**

Note:.Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

_____

SECTION-I

1. a) Explain the various types of material used in construction of core of transformer. Briefly explain all the properties. Explain how quality of core material is related with core losses in transformer?

    b) A 200 kVA transformer has an efficiency of 98 % at full load. If the maximum efficiency occurs at three quarters of full-load, calculate the efficiency at half full-load. Assume negligible magnetizing current and 0.8 lagging power factor at all loads.?

OR

2. a) Draw the phasor diagram of a transformer on no-load and explain the function of active and reactive components of no-load current of transformer?

    b) Discuss the effect of variable frequency and supply voltage on iron loss and performance of the transformer?

SECTION-II

3. a) In a no-load test of single-phase transformer, the following test data is obtained. Primary voltage = 220 V, Secondary voltage = 110 V, primary current = 0.5 A, power input = 30 W. Resistance of the primary winding = 0.6 Ω. Calculate the magnetizing component of no-load current and iron loss.?

    b) A 11000 / 2200 V, 100 kVA, single phase two winding transformer is to be used as an auto-transformer by connecting the two windings in series. Give the possible values of voltage ratios and kVA outputs.?

_OR_

4. Draw the phasor diagrams corresponding to parallel operation of transformers with (i) Equal voltage ratio and (ii) Unequal voltage ratios.?

SECTION-III

5. a) Explain Scott connection used in poly phase transformers with neat diagrams.?

    b) Discuss in detail about Δ / Δ and Y / Y connection?

_OR_

6. A 3-phase Δ-Δ bank consists of three 25 kVA, 3,300 / 300 V transformers and supplies a load of 50 kVA. After removing one transformer, determine the following for Y-Y connection
  (i) kVA load carried by each transformer,
  (ii) Percent of rated load carried by each transformer and Total kVA rating.

SECTION-IV

7. A 3-phase, 4-pole, 415 V, 50 Hz, delta connected induction motor running at a slip of 4 %. The stator winding is delta connected with 240 conductors connected with 48 conductors per phase. The per phase rotor winding resistance is 0.013 Ω and a leakage reactance of 0.048 Ω at standstill. Calculate the following:
  (i)The per phase rotor EMF at standstill with the rotor open circuit,
  (ii)The rotor EMF and current at 4 % slip
  (iii)The phase difference between the rotor EMF and rotor current at 4 % slip.

OR

8.a) Obtain the ratio of maximum torque to full-load torque and maximum torque to starting torque.?
  b) Based on the approximate equivalent circuit, derive an expression for the electromagnetic torque developed by a 3-phase induction motor and hence determine the condition for maximum torque?.

SECTION-V

9. a) A 6-pole, 50 Hz, 3-phase induction motor is running at 3 % slip when delivering full load torque. It has standstill rotor resistance of 0.2 Ω and reactance of 0.4 Ω per phase. Calculate the speed of the motor, if an additional resistance of 0.6 Ω per phase is inserted in the rotor circuit. The full load torque remains constant.?
  b) A four pole 50 Hz, 3-phase induction motor develops a maximum torque of 110 N-m at 1360 r.p.m. The resistance of star connected rotor is 0.25 Ω / phase. Calculate the value of resistance that must be inserted in series with each rotor phase that produces a starting torque equal to half maximum torque.?
OR
10.a) Calculate the value of resistance elements of 5-step starter for 3-phase 400 V wound rotor induction motor. The full load slip is 3 %, rotor resistance per phase is 0.015. If,
   (i) The starting current is limited to full-load current
   (ii)The starting current is limited to 1.5 times full-load current.
  b) 415 V, 29.84 kW, 50 Hz, delta connected motor game has the following test data.
        No-load: 415 V, 21 A, 1250 W
        Blocked rotor test: 100 V, 45 A, 2730 W
Construct the circle diagram and determine the line current and power factor for rated output. Calculate the minimum torque. Assume stator and rotor copper losses equal at standstill.?

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. -I India)
UG Model Question Paper-I
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
POWER SYSTEMS-I
II YEAR II SEMESER

<u>**Time: 3 hours**</u>   <u>**Max Marks: 70**</u>

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1. Draw the complete schematic diagram of a coal fired thermal power plant. Label Each component. Discuss briefly the function of each component.   [14M]

(OR)

2.a) What are the functions of moderator and control rods in a nuclear power plants.   [7M]
b) Distinguish between thermal and fast reactors. Classify each according to moderator, coolant and fuel utilized.   [7M]

SECTION-II

3.a)Discuss the various factors which affect the location of site of a hydro-power station.   [7M]
b) Explain about the difference between the impulse and reaction turbines.   [7M]

(OR)

4.A hydro-electric power station has a reservoir of area 2.4 sq. km. and a capacity of 5×10^6 m^3 . The effective head of water is 100m. The penstock, turbine and generation efficiencies are respectively 95%, 90% and 85%. (i) Calculate the total electrical energy that can be generated from the power station. (ii) If a load of 15,000kW has been supplied for 3 hours, find the fall in reservoir level.   [14M]

SECTION-III

5.a) A 3-phase, 50Hz, 132kV overhead line has conductors placed in a horizontal plane 4m apart. Conductor diameter is 2cm if the line length is 100 km, calculate the charging current per phase assuming complete transposition.   [9M]
b) What is the effect of unsymmetrical spacing of conductors in a 3-phase transmission line?   [5M]

(OR)

6.a) Derive the expression for the inductance of a 3 phase double circuit line with symmetrical spacing?   [7M]
b) A single phase 10 km line is 8m above the ground and diameter of the conductor is 2.1cm and are separated by 4m horizontally. Find capacitance between conductors, between phase and neutral, capacitance when earth effect is neglected and charging current when line is charged at 33kV, 50Hz supply.   [7M]

SECTION-IV

7.a) Show how regulation and transmission efficiency can be determined for medium
lines using (i) nominal-T method and (ii) nominal-Π method. [7M]
b) A 3-phase line delivers 3500 kW at 0.8 p.f lag to a load. The impedance of the line is
(2+j5) Ω. If the sending end voltage is 33 kV, determine the receiving end voltage, line
current and efficiency of the line. [7M]

(OR)

8.a) Explain the concept surge impendence loading of long lines. [7M]
b) Derive the expression for the percentage voltage regulation of a short
transmission line by using phasor diagram. [7M]

SECTION-V

9.a)Develop an equivalent circuit at the transition points of transmission lines for analyzing
the behavior of travelling waves. [8M]
b) Derive the travelling wave equations in a lossless transmission line. [6M]

(OR)

10.a)What are different types of transients? [5M]
b)Why surge impedance in overhead lines is more than that of underground cables?.
Explain. [9M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. -I India)
UG Model Question Paper-II
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
POWER SYSTEMS-I
II YEAR II SEMESER

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

5*14=70M

SECTION-I

1.a) What are the types of steam turbine? Briefly discuss about their use and characteristics. [7M]

b) What are the methods of producing nuclear reaction? What is chain reaction? [7M]

(OR)

2.a)What are the essential requirements of nuclear power station design? Explain. [7M]

b) Explain in detail the constructional aspects of a gas turbine plant. [7M]

SECTION-II

3.a) Explain the elements of hydro electric power station. [7M]

b)Explain Francis turbine and Kaplan turbine. [7M]

(OR)

4.a) What are the factors to be considered while selection of site for hydroelectric power station? [7M]

(b) A hydroelectric power plant operates under an effective head of 50 metres and a discharge of 94 m3/sec. Determine the power developed assuming hoverall = 80% . [7M]

SECTION-III

5.a)Derive the expression for the inductance of a 3 phase double circuit line with symmetrical spacing? [7M]

b) A single phase 10 km line is 8m above the ground and diameter of the conductor is 2.1cm and are separated by 4m horizontally. Find capacitance between conductors, between phase and neutral, capacitance when earth effect is neglected and charging current when line is charged at 33kV, 50Hz supply? [7M]

(OR)

6.a) Derive the expression for the flux linkages with one sub conductor of a composite conductor? [7M]

b) Find the inductance of a line consisting of two ACSR conductors spaced between conductors of 1m. The outer diameter of the single layer of aluminum strand is 50.1mm and the radius of each strand is 8.4mm. Neglect the effect of central strand of steel on the inductance? [7M]

SECTION-IV

7.a) Derive the expression for the percentage voltage regulation of a short transmission line by using phasor diagram? [7M]

b) A 3-phase 5km long transmission line having resistance of 0.51 ohms/km and inductance of 1.75mH/km is delivering power at 0.8 power factor lagging, the receiving end voltage is 32kV and sending end voltage is 33kV,50Hz. Determine the line current, regulation and efficiency of the transmission line? [7M]

(OR)

8.a) Derive the A, B, C, D constants of transmission line with transformers on
 both sides. [7M]

b) Drive the necessary expressions for the long transmission line? [7M]

SECTION-V

9.a) Analyze the Ferranti effect by assuming half of the capacitance is concentrated at the receiving end? [7M]

b) A 3-phase 220kV,50Hz transmission line consists of 30mm diameter conductor 2.51m apart in the form of equilateral triangle. If the temperature is 38^0C and atmospheric pressure is 76cm. Find the corona loss per km of the line? The irregularity factor is 0.83 and the stress is 21.21kV/cm. [7M]

(OR)

10. a) Explain the transient behavior of a line when it is open circuited at the receiving end? [7M]

b) A rectangular wave travels along a 500km line terminated with a resistance of1000 ohms. The line has a resistance of 0.32 ohm/km and surge impedance of 400 ohm. If the voltage at the termination point after two successive reflections is 200kv. Find the amplitude of the incoming surge? [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. -I India)
UG Model Question Paper-III
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
POWER SYSTEMS-I
II YEAR II SEMESER

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

5*14=70M

SECTION-I

1.a) What are the systems used for firing the Boilers explain by giving small sketches.   [7M]
 b) State the main parts of Nuclear Power Station, and describe the function of each.   [7M]

(OR)

2. (a) Discuss briefly the ratio-active pollution of environment by nuclear power plant.   [6M]
(b) Describe the different types of fuels used in a nuclear power plant and discuss the problems of nuclear waste disposal.   [8M]

SECTION-II

3. a) Explain the principle of operation of Pumped Storage Plant. How does it help to take up sudden peak loads in a power system?   [7M]
 b) Describe the characteristics of the various types of Turbines used in hydro-electric power stations with particular reference to i) head ii) efficiency at various loads, and iii) specific speed, and state how these factors help in the choice of the turbine.   [7M]

(OR)

4. Explain the working of hydro-electric power station with a neat sketch.   [14M]

SECTION-III

5.a) Find GMD, GMR for each circuit, inductance for each circuit and total inductance per meter for two circuits that run parallel to each other. One circuit consists of three0.25 cm radius conductors. The second circuit consists of two 0.5 cm radius conductors as shown in the figure below.   [9M]
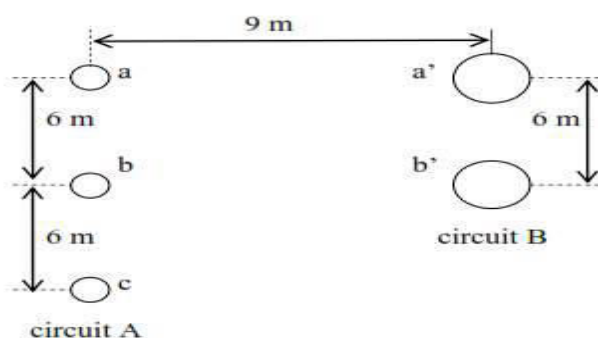
b).Find an expression for the flux linkages in parallel current carrying conductors. [5M]

(OR)

6.a) Derive the expression for inductance of a three phase double circuit line. [7M]
b) Three conductors of three phase line are arranged at corners of triangle of sides 2m, 3.2m and 4m. The diameter of the conductor is 2.5cm. Calculate the inductance and capacitance of a three phase three wire system. [7M]

SECTION-IV

7.a) Analyze a medium transmission line with nominal-T method and draw the phasor diagram? [7M]
b) A three phase 50Hz transmission line , 100km long delivers 25MW at 100KV at 0.75 power factor lagging. The resistance and reactance of the lines per phase per kilometer are 0.32 ohms and 0.57 ohms respectively while the admittance is $2.5*10^{-6}$ mho/ km/ph. Calculate the efficiency of the transmission by using nominal-π method? [7M]

(OR)

8.a)Show how regulation and transmission efficiency are determined for medium lines using end condenser method and illustrate your answer with suitable vector diagram. [6M]
b) A three phase transmission line is 135 km long. The series impedance is Z=0.04 + j 0.95 ohm per phase per km, and shunt admittance is Y=j 5.1×10^{-6} mho per phase per km. The sending end voltage is 132 kV and the sending end current is 154 A at 0.9 power factor lagging. Determine the voltage, current and power at the receiving end and the voltage regulation using medium line-T model. [8M]

SECTION-V

9.a) Derive reflection and refraction coefficient of transmission line when receiving end is open circuited. [7M]
b) A cable has a conductor of radius 0.75cm and a sheath inner radius 2.5cm. Find (i) the inductance per meter length, (ii) capacitance per meter length, (iii) surge impedance and (iv) velocity of propagation, if the permittivity of insulation is 4. [7M]

(OR)

10.Derive the travelling wave equations in a lossless transmission line. [6M]
b) The ends of two long transmission lines, A and C are connected by a cable B, 1kmlong. The surge impedances of A, B, C are 400, 50 and 500 ohms respectively. A rectangular voltage wave of 25 kV magnitude and of infinite length is initiated in A and travels to C, determine the first and second voltages impressed on C. [8M]

Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1.   a) State and Prove Gauss's Law.
      b) Obtain the expression for electric field intensity for infinite line charge using Gauss's law. [7+7]

OR

2.   a) State and explain the coulombs
      b) Define and derive the relation between E and V. [7+7]

Section-II

3.   a) Show the expression of the capacitance for a spherical capacitor consists of 2 concentric spheres of radius 'a'&'b' also obtain the capacitance for an isolated sphere.
      b) Find the capacitance of a conducting sphere of 2 cm in diameter, covered with a layer   of polyethelene with $\in r = 2.26$ and 3 cm thick.[7+7]

OR

4.   a) Derive an expression for capacitance of co-axial cable.
      b) In a material for which σ = 5.0 s/m and $\in r = 1$, the electric field intensity is E = 250 Sin1010t (V/m). Find the conduction and displacement current densities. [7+7]

Section-III

5.   a) Using Biot-Savart's law, find the magnetic field intensity on the axis of a circular loop with radius R and carrying a steady current I.
      b) Find the magnetic field intensity at the centre of square loop of side 5m carrying 10A of current. [7+7]

OR

6.   a) State Ampere's circuital law and explain any two applications of Ampere's Circuital law.
      b) Derive the equation to show that curl of magnetic field intensity in equal to current density. [7+7]

Section-IV

7.   a) Show that the force between two parallel conductors carrying current in the same direction is attractive.
      b) A magnetic field, B = 3.5×10-2 ˆz a Tesla, exerts a force on a 0.3m conductor along the x-axis. If the conductor current is 5 A in the -Ax direction, what force must be applied to hold the conductor in position. [7+7]

<div align="center">OR</div>

8.   a) Derive the expression for self inductance of a coaxial cable of inner radius 'a' and outer radius 'b'.

          b) Determine the inductance of a solenoid of 2500 turns wound uniformly over a length of 0.25m on a cylindrical paper tube, 4 cm in diameter and the medium is air.

Section-V

9.   a) Write Maxwell's equations in integral form for time varying Fields.

          b) Generalize Ampere's law for time varying fields. [7+7]

<div align="center">OR</div>

10.   a) State and explain Faraday's laws of electromagnetic induction.

          b) In a material for which $\sigma = 5.0$ s/m and $\in r = 1$, the electric field intensity is $E = 250 \sin 1010t$ (V/m). Find the conduction and displacement current densities, and the frequency at which they have equal magnitudes. [7+7]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
UG Model question paper-II
ELECTRO MAGNETIC FIELDS

Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. a) State and prove Gauss's law as applied to an electric field and determine the field due to an infinite line charge.
    b) Derive Poisson's and Laplace equations starting from point form of Gauss Law.[7+7]

<div align="center">OR</div>

2. a) Show that the electric filed intensity at any point inside a hollow charged Spherical conductor is zero.
    b) Three point charges each 5 nC are located on the x-axis at points: -1, 0 and + 1 m in free space. (i) Find E at x=5. (ii) Determine the value and location of the equivalent single point charge that would produce the same field at very large distance. [7+7]

Section-II

3. a) Establish the electrostatic boundary conditions for the tangential components of electric field and electric displacement at the boundary of two non dielectrics.
    b) The relative permittivity of dielectric in a parallel plate capacitor varies linearly from 4 to 8. If the distance of separation of plates is 1 cm and area of crosssection of plates is 12 cm2, find the capacitance. Derive the formula used. [7+7]

<div align="center">OR</div>

4. a) A spherical capacitor with inner sphere of radius 1.5 cm and outer sphere of radius 3.8 cm has an homogeneous dielectric of $\varepsilon = 10\ \varepsilon 0$. Calculate the capacitance of the capacitor. Derive the formula used.
    b) Prove that the derivative of the energy stored in an electrostatic field with respect to volume is ½ D.E, where D and E electric flux density and electric field intensity respectively. [7+7]

Section-III

5. a) State and explain Biot-Savart's law and derive the expression for the magnetic field at a point due to an infinitely long conductor carrying current.
    b) What are the limitations of Amperes current law? How this law can be modified to time varying field? [7+7]

<div align="center">OR</div>

6. a) Derive Maxwell's second equation div (B)=0.
    b) Derive magnetic field intensity due to a square current carrying element. [7+7]

Section-IV

7. a) Derive the Neumann's formulae for the calculation of self and mutual inductances.
   b) Explain the concept of vector magnetic potentials. [7+7]

OR

8. a) Determine the inductance of a toroid.
   b) A rectangular coil of area 10 cm2 carrying a current of 50 A lies on plane $2x + 6y - 3z = 7$ such that the magnetic moment of the coil is directed away from the origin. Calculate its magnetic moment. [7+7]

Section-V

9. a) Explain concept of displacement current and obtain an expression for the displacement current density.
   b) Explain in detail about modification of Maxwell's equations for time varying fields. [7+7]

OR

10. a) Explain Faraday's laws of electromagnetic induction and derive the expression for   induced EMF.
    b) Derive Maxwell's equations in integral form for time varying Fields.[7+7]

Time: 3hours   Max Marks: 70M

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1.   a) Derive the expression for electric field intensity due to line charge.
        b) Four concentrated charges Q1 = 0.3 μC, Q2 = 0.2 μC, Q3 = −0.3 μC, Q4 = 0.2 μC are located at the vertices of a plane rectangle. The length of rectangle is 5 cm and breadth of the rectangle is 2 cm. Find the magnitude and direction of resultant force on Q1. [7+7]

OR

2.   a) Explain the Laplace and Poisson's equations for electrostatic fields.
        b) Using Gauss law, derive an expression for electric field intensity at any point inside and outside of a sphere of radius 'a' due to a uniform spherical charge distribution of volume charge density of 'ρ'. [7+7]

Section-II

3.   a) Derive the expression for energy stored and energy density in static electric field.
        b) A parallel plate capacitor consists of two square metal plates of side 500 mm and separated by a 10 mm slab of Teflon with ϵr = 2 and 6 mm thickness is placed on the lower plate leaving an air gap of 4mm thick between it and upper plate. If 100 V is applied across the capacitor, find D, in Teflon and air. [7+7]

OR

4.   a) State and prove the conditions on the tangential and normal components of electric flux density and electric field intensity, at the boundary between the dielectrics.
        b) A square parallel plate capacitor 200 mm on side with a plate spacing of 25 mm is filled with a dielectric slap (ϵr =240 of the same dimensions if 100 V is applied to the capacitor) Find: (i) the polarization P in the dielectric and (ii) the energy stored by the capacitor. [7+7]

Section-III

5.   a) State Biot-Savart's law for magnetic field B due to a steady line current in free space.
        b) Derive an expression for magnetic field intensity due to infinite sheet of current. [7+7]

OR

6. a) A steady current of 10 A is established in a long straight hollow aluminum conductor having inner and outer radius of 1.5 cm and 3 cm respectively. Find the value of B as function of radius.
    b) Derive an expression for the magnetic field strength at the center of a square loop of side 'a' meters and N turns. [7+7]

Section-IV

7. a) Derive point form of Ampere's circuital law.
    b) Two infinitely long parallel conductors are separated by a distance 'd'. Find the force per unit length exerted by one of the conductor on the other if the currents in the two conductors are I1 and I2. [7+7]

                                OR

8. a) Derive the expression for inductance of a solenoid.
    b) A single-phase circuit comprises two parallel conductors A and B, each 1 cm diameter and spaced 1 meter apart. The conductors carry currents of +100 and -100 amperes respectively. Determine the magnetic field intensity at the surface of each conductor and also exactly midway between A and B. [7+7]

Section-V

9. a) A conductor with cross sectional area of 10 cm2 carries a conduction current of 0.2 sin(109t) mA. Given that σ = 2.5 × 106 S/m and εr = 6, calculate the magnitude of the displacement current density.
    b) Derive the Maxwell's equations in point and integral form for time varying fields. [7+7]

                                OR

10. a) Explain the concept of displacement current and obtain an expression for the displacement current density.
    b) Derive Maxwell's fourth equation. [7+7]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper I -2018
ANALOG CIRCUITS

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

1. (a) Derive the expression for the CE short-circuit current gain Ai as a function of frequency.
   (b) Define $f\beta$ and fT. Find the current gain with resistive load

OR

2. (a) Explain the choice of configuration in a cascade of Amplifiers
   (b) A two-stage amplifier circuit in a CE-CC configuration. The transistor parameters at the corresponding quiescent points are hie=1KΩ, hre=10-4, hfe=50, hoe=10-4 A/V. hic=1KΩ,
   hrc=1, hfc= -51, hoc=10-4 A/V. Find the input and output impedances and individual, as well as overall, voltage and current gains.

3. (a) Explain and justify the effect of Negative feedback on the characteristics of an amplifier. b) An amplifier with open loop gain of 2000±150 is available. It is necessary to have
   the amplifier whose voltage gain varies by not more than ±0.2%. Calculate the feedback factor β, and the gain of the amplifier with feedback.

OR

4. (a) Explain the classification of oscillators
   (b) Derive the expression for the frequency of oscillations of a BJT-RC Phase shift Oscillator.

5. (a) What is the drawback of class B amplifier. How it is going to be overcome using class AB Amplifier with neat diagram.
   (b) Write about the operation of complementary symmetry class b push pull Amplifiers

OR

6. (a) Write notes on the following:
   i) Stagger Tuning ii) Single Tuned Amplifiers.
   (b) Write the applications of tuned amplifiers

7. Draw and explain the circuit of Astable Multivibrator with necessary waveforms and also Derive the expression for its frequency of oscillations.

8. A self-biased binary uses n-p-n transistors have maximum values of VCE(sat)=0.4V and

VBE(sat) = 0.8V and VBE cutoff = 0V. The circuit parameters are VCC = 15V, RC = 1KΩ, R1 = 6KΩ, R2 = 5KΩ and RE = 500Ω.

a) Find the stable-state currents and voltages.

b) Find the minimum value of hFE required for BJT to provide the above stable state values. c) Also determine ICBO(max) to which ICBO raises as temperature rises where neither BJT is off.

9. a) with the help of a neat circuit diagram , explain the working of a transistor current time
   base generator

   b) Explain the methods of generating a time –base waveform?

                                    OR

10.(a) Explain the basic principles of Miller Time Base generator

   (b) Explain the applications of Time Base Generator

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper II -2018
ANALOG CIRCUITS

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

1. (a) Explain how the parameters of hybrid-π model varies with IC, VCE and temperature.
   (b) The hybrid-π parameters of the transistor used in circuit are : gm = 50mA/V, rbb'=100,
       rb'e= 1K, rb'c = 4M, rce = 80K, Cc = 3PF, Ce = 100 PF. Using Miller's theorem and the appropriate analysis, compute
       i. The upper 3 dB frequency of the current gain AI
       ii. The magnitude of voltage gain at the frequency of part (i)
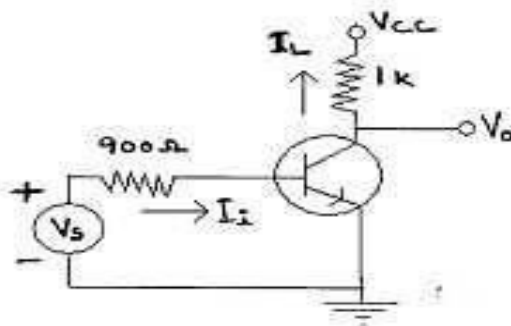
OR

2. Two transistor amplifier circuits are cascaded as shown in the figure shown below .The h-parameter values are as given under. Determine the overall voltage gain Av.hie=2.2k hfe=40 hre=5×10−4 hoe=25μmho hie=1.8k hfe=-50 hre=1 hoe=25μA/V
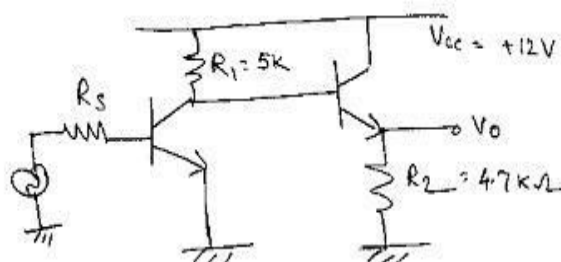
3. (a) Draw the circuit diagram of a current series feedback and derive expressions for Voltage gain and output resistance and input resistance .

   (b) Show that Voltage shunt feedback amplifier transresistance gain, Ri, Ro are decreased by a factor $(1+A\beta)$ with feedback.

OR

4. (a) Derive the expression for frequency of Oscillation for a Colpitts Oscillator.

   (b) In a A Hartley Oscillator L2=0.04mH,C=0.004UH.If the frequecny of Oscillation is 150 kHz,find L1.neglect mutual Inductance.

5. (a) Show that even harmonics cancel out and overall distortion is reduced in a push pull configuration

   (b) Compare series fed and Transformer coupled Class A Amplifiers.

6. (a) Define Conversion efficiency. Determine the maximum value of Conversion efficiency for a series fed Class-A Power Amplifier.

   (b) In series fed Class - A power amplifier, explain the importance of the position of operating point on output signal swing.

7. Draw and explain the circuit of Monostable Multivibrator with necessary waveforms and also Derive the expression of delay time.

OR

8. Explain the operation of emitter-coupled bi-stable multivibrator. Also discuss different methods of triggering a bi-stable multivibrator

9. a) Draw and explain the circuit of transistorized Bootstrap sweep generator. Derive an expression For etrace interval, Tr.

   b) Draw the circuit of simple current time-base generator and explain its operation with the help of neat waveforms and necessary equations.

OR

10. (a) Briefly describe various methods to achieve sweep linearity in time-base circuits.

    (b)) Draw and explain the circuit of transistorized Miller Time Base generator

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper III -2018
ANALOG CIRCUITS

Time: 3 hours   **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

1. (a) What are the typical values of various components in Hybrid - π model?
   (b) The following low- frequency parameters are known for a given transistor at IC = 10mA, VCE =10 V, and at room temperature,
       hie = 500
       hoe = 4x10−5
   A/V hfe = 100
       hre = 10−4.
   At the same operating point, fT = 50MHz and Cc=3PF, compute the values of all the Hybrid - π parameters

                                          OR

2. (a) Discuss about different types of distortions that occur in amplifier circuits
   (b) A two-stage amplifier circuit (CE-CC configuration) is shown in figure. The h-parameter values are hfe = 50, hie=2 K , hre =6× 10−4, hoe = 25μA/V.hfc = -51, hic =2 K, hrc = 1, hoc = 25μ A/V. Find the input and output impedances and individual, as well as overall voltage and current gains.
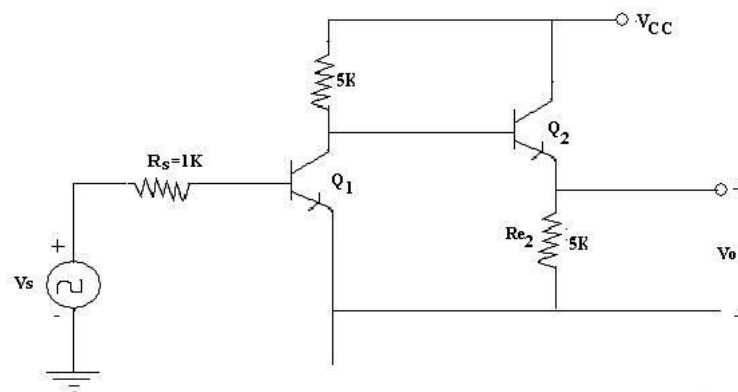
3. (a) Derive an expression for transfer gain of a feedback amplifier.
   (b) The feedback amplifier shown has transistor parameters hie= 1k, hre and hoe negligible. Find Rmf=Vo/Is Avf=Vo/Vs Rif and Rof.
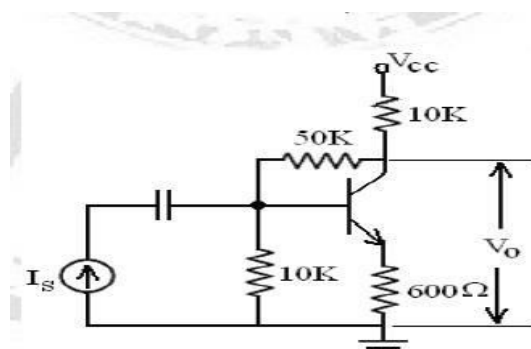
OR

4. (a) Explain why RC Oscillators are preferred for low frequencies?
    (b) Draw a neat Circuit diagram of Phase Shift Oscillator using BJT and
        derive the expression for minimum hfe required to sustain
        oscillations.

5. (a) Explain the reasons for harmonic distortion in push pull power amplifiers.
   (b) Derive the expression for the power of output signal having distortion.

6. (a) Show that even harmonics cancel out and overall distortion is reduced
       in a push pull Configuration.
   b) Compare series fed and Transformer coupled Class A Amplifiers

7. (a) Explain how transistor acts as a switch
   (b) Draw and explain the circuit of Bistable Multivibrator with necessary
   waveforms

8. Explain the operation of Astable Multivibrator with neat circuit diagram and
    necessary wave forms

9. a) With neat sketches and necessary expressions, explain the transistor
      Miller time-base generator.
   b) Briefly describe various methods to achieve sweep linearity in time-base
       circuits

OR

10.(a) Explain the basic principles of Bootstrap Time Base generator
    (b) Explain about current Time base Generator.

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper I -2018
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I
1. a) what is managerial economics? Discuss the nature & Scope of Managerial economics   [7M]
   b) What is demand forecasting? Explain various factors involved in demand forecasting.   [7M]
                                            OR
2.   a) Explain Law of Demand with its exceptions [7M]
      b) Distinguish between Micro and Macroeconomic concepts [7M]

Section-II
3.   a)Define Production function. How can a producer find it useful? Illustrate.[7M]
      b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis. [7M]
                                            OR
4.   a) Distinguish between explicit and implicit costs? [3M]
      b) State and illustrate Cobb-Douglas production function. What are the properties of this
         function? (5M)
     c) Calculate the BEP in units and rupees using the following details:•Selling price per unit
        Rs.100 Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (6M)

Section-III

5.   a) Define Market. Explain the structure of market with suitable examples.   [7M]
      b) Define partnership. Explain its features and evaluate it as against sole proprietorship   [7M]
                                            OR
6.   a) what is price? Explain different methods of Pricing.   [7M]
      b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole
         havefulfilled that need?   [7M]

Section-IV
7.   a) What are the accounting concepts that govern accounting process? Explain in brief. [7M]
     b) Explain the main sources have long term finance.   [7M]
                                            OR
8. a) Explain the factors affecting the requirements of working capital.   [7M]
   b) Explain about cash and capital budget.   [7M]
Section-V

 9. a) what is capital budgeting ? Explain methods of capital budgeting?   [7M]
    b) What is ratio analysis? Explain different types of ratio analysis   [7M]
                                            OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return.   [7M]

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal 2	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

b) What do you mean by capital budgeting? Explain its significance.   [7M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper I -2018
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I
1. a) what is managerial economics? Discuss the nature & Scope of Managerial economics   [7M]
   b) What is demand forecasting? Explain various factors involved in demand forecasting.   [7M]

OR

2. a) Explain Law of Demand with its exceptions [7M]
    b) Distinguish between Micro and Macroeconomic concepts [7M]

Section-II
3. a)Define Production function. How can a producer find it useful? Illustrate.   [7M]
    b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis.   [7M]

OR

4. a) Discuss about the economies and diseconomies of scale.   [7M]
    b) Calculate the BEP in units and rupees using the following details: • Selling price per Rs.100. Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000   [7M]

Section-III
5. a) Define Market. Explain the structure of market with suitable examples.
    b) Define partnership. Explain its features and evaluate it as against sole proprietorship

OR

6. a) what is price? Explain different methods of Pricing.   [7M]
    b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have   fulfilled that need?   [7M]

Section-IV
7. a) What are the accounting concepts that govern accounting process? Explain in brief.   [7M]
    b) Explain the main sources have long term finance.   [7M]

OR

8. a) Explain the factors affecting the requirements of working capital.   [7M]
   b) Explain about cash and capital budget.   [7M]

Section-V
9. a) what is capital budgeting ? Explain methods of capital budgeting?   [7M]
   b) What is ratio analysis? Explain different types of ratio analysis   [7M]

OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return.   [7M]

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal 2	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

b) What do you mean by capital budgeting? Explain its significance.   [7M]

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper III -2018
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. a) "Managerial Economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management". Explain?
[7M]
   b) Define demand and describe its determinants with suitable examples? [7M]

OR

2. a) What do you understand by Elasticity of demand? How do you measure it? What is its significance? [7M]
   b) What do you understand by demand? What the different types are of demand? [7M]

Section-II

3. a) Explain and illustrate the following: and also mention why they arise: a) The Law of Constant Returns b) The Law of increasing returns. [7M]
   b) discuss about iso quants and iso costs?[7M]

OR

4. a) Define BEP. How do you determine it. Show graphical presentation of BEA[7M]
   b)You are given the following information for the year 2003 of XYZ Co. Ltd: Variable Cost 6,00,000 60% Fixed Cost 3,00,000 30% Net Profit 1,00,000 10% 10,00,000 100% Find out i) Break Even Point in units and sales ii) PV Ratio iii) Margin of Safety iv) Number of units that must be sold to earn a profit of 5,00,000 v) How many units must be sold to earn a net income of 13.5% of sales[7M]

Section-III

5. a) Do you think monopoly is present in the current business environment? Explain it with suitable examples.[7M]
   b) Explain the merits and demerits of different forms of Business organization and their suitability with different types of business Activities [7M]

OR

6. a) what is pricing? Explain objectives and policies behind pricing. [7M]
   b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? [7M]

Section-IV

7. a) What are the accounting concepts that govern accounting process? Explain in brief. [7M]
b) Explain the main sources have long term finance. [7M]

OR

8. a) Explain the factors affecting the requirements of working capital. [7M]
   b) Explain about cash and capital budget. [7M]

Section-V

9. a) what is capital budgeting ? Explain methods of capital budgeting? [7M]

b) What is ratio analysis? Explain different types of ratio analysis   [7M]

OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return.
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b) What do you mean by capital budgeting? Explain its significance.   [7M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
DATABASE SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   **Max Marks: 70**

Note:.Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

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1. a) Explain the difference between File Processing System and Database Management Systems?
   b) Explain Database languages.

<div align="center">OR</div>

2. a) Explain the architecture of DBMS with neat sketch
   b) Explain the role of DBA.?

3. Explain the following with examples.
           a) Key constraints. b) Foreign key constraints.

<div align="center">*OR*</div>

4. a) Explain the Purpose of an ER Diagram with Notations
   b) what is view in SQL.? How is it defined.?

5. a) Explain the various types of JOINs in Database system with suitable example for each
   b) Write and explain with SQL queries about UNION, INSERSECT, ALL and EXCEPT

<div align="center">*OR*</div>

6. a) What are the aggregate Functions? And list the aggregate functions supported in SQL?
   b) Explain Correlated and uncorrelated queries with example

7. a) Why Normalization is required in DBMS.? Explain different types of Normal Forms.?
   b) What is functional dependency.? Explain with example

<div align="center">OR</div>

8. a) Define BCNF. How does it differ from 3NF?
   b) Explain the problem caused by redundancy?

9. Explain the Transaction Properties of Database Management Systems
<div align="center">OR</div>
10. What is Serilazability.? Explain why Serilazability is required with Example?

<div align="center">**************</div>

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
DATABASE SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   **Max Marks: 70**

Note:.Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

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1. a) Explain the Characteristics of Database Management Systems?
   b) Explain levels of abstraction in DBMS
                                              OR
2. a) Define Query. Explain the data Manipulation Language in detail
   b) Differentiate Database users and Database Administrator

3. Explain how to build ER Model for University with entities department, instructor, student,   and class. Instructors and students belong to one department only. Instructor and students   related to a class with many to many relations. Assume suitable attribute. Explain how the ER   model can be translated to relations.
                                              OR
4. a) Explain the purpose of KEYS in Database Systems and Explain different types of KEYS
   b) List and explain the design issues in ER Model

5. a) Compare the Nested Query and Correlated Query. Explain with Examples
   b) Explain the following with example.?
      i) Equi-Join   ii) Non-Equi Join   iii) NULL Values

                                              OR
6. a) What are nested queries? What is correlation in nested queries? Explain
   b) Write a SQLqueries for following and explain
    a)   Average() or Avg()
    b)   Count() or Count(*)
    c)   Maximum() or Max()
    d)   Median()

7. Why is a table whose primary key consists of a single attribute automatically in 2NF when
   it is in 1NF? Explain.
                                              OR
8.a) Explain Armstrong's Axioms in dependency
   b) Explain the difference between 3NF and BCNF

9. a) Explain how concurrency execution of transactions improves overall system performance?
   b) Explain validation control protocol?
                                              OR
10. a) Explain Time-Stamp Based Concurrency Control Protocol
    b) Define ACID Properties in DBMS

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R 18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester Examinations
DATABASE SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   **Max Marks: 70**

Note:.Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions.

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1. a) Explain the drawbacks of File Processing System over Database Management Systems?
   b) Explain levels of abstraction in DBMS

                                                OR
2. a) Define Query. Explain the data Manipulation Language in detail
   b) Explain the role of Database Architecture?

3. a) Explain different key constraints in Database systems
   b) Explain the purpose of ER Diagram with example

                                                OR
4. a) Explain the ER Diagram with Notations and example
   b) Explain the role of key in database system and explain few keys in Database systems

5. a) Compare the Nested Query and Correlated Query. Explain with Examples
   b) Write and explain with SQL queries about UNION, INSERSECT, ALL and EXCEPT

                                                OR
6. a) What are the aggregate Functions? And list the aggregate functions supported in SQL?
   b) List and explain the various JOIN Statements with example for each.

7. a) Why Normalization is required in DBMS.? Explain different types of Normal Forms.?
   b) What is functional dependency.? Explain with example

                                                OR
8.a) Explain Armstrong's Axioms in dependency
   b) Explain the difference between 3NF and BCNF

9. a) Explain the Transaction Properties of Database Management Systems
                                                OR
10.a) Explain System log and commit point in database systems
   b) Explain about Testing of Serializability in detail