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
ELECTRONICS AND COMMUNICATION 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

(Autonomous Institution – UGC, Govt. of India)

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(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.
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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 ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE STRUCTURE

I Year B. Tech – I Semester (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 (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 (III 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 & Circuits	3	-	-	3	30	70
3	R18A0402	Signals & Systems	3	-	-	3	30	70
4	R18A0403	Switching Theory & Logic Design	3	-	-	3	30	70
5	R18A0404	Probability Theory & Stochastic Process	3	-	-	3	30	70
6	R18A0405	Network Analysis & Transmission Lines	3	-	-	3	30	70
7	R18A0481	Electronic Devices & Circuits Lab	-	-	3	1.5	30	70
8	R18A0482	Basic Simulation Lab	-	-	3	1.5	30	70
9*	R18A0004	Foreign Language: French	2	-	-	-	100	-
		TOTAL	**20**	**-**	**06**	**21**	**340**	**560**

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

II Year B. Tech – I Semester (IV Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0210	Control Systems	3	-	-	3	30	70
2	R18A0406	Analog Circuits	3	-	-	3	30	70
3	R18A0407	Electromagnetic Fields & Waves	3	-	-	3	30	70
4	R18A0408	Analog Communications	3	-	-	3	30	70
5	R18A0061	Managerial Economics & Financial Analysis	3	-	-	3	30	70
6	OE1	OPEN ELECTIVE 1	3	-	-	3	30	70
7	R18A0483	Analog Circuits Lab	-	-	3	1.5	30	70
8	R18A0484	Analog Communications Lab	-	-	3	1.5	30	70
9*	R18A0014	Environmental Science	2	-	-	-	100	-
		TOTAL	**20**	**-**	**06**	**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 (V Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0409	Digital Communications	3	-	-	3	30	70
2	R18A0410	LDIC	3	-	-	3	30	70
3	R18A0411	Antennas & Wave Propagation	3	-	-	3	30	70
4	R18A0412	Cellular & Mobile Communications	3	-	-	3	30	70
5	R18A0413 R18A0509 R18A0517	1. Electronic Measurements & Instruments 2.Java Programming 3. Scripting Language	3	-	-	3	30	70
6	OE2	OPEN ELECTIVE 2	3	-	-	3	30	70
7	R18A0485	Digital Communications Lab	-	-	3	1.5	30	70
8	R18A0486	LDIC Lab	-	-	3	1.5	30	70
9*	R18A0006	Technical Communication & Soft Skills	2	-	-	-	100	-
		TOTAL	**20**	**-**	**06**	**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 (VI Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0414	Digital Signal Processing	3	-	-	3	30	70
2	R18A0415	Microprocessors & Microcontrollers	3	-	-	3	30	70
3	R18A0514	Computer Networks	3	-	-	3	30	70
4	R18A0504 R18A0416 R18A0417	1. Operating Systems 2. Fiber Optical Communications 3. Information Theory & Coding	3	-	-	3	30	70
5	OE3	OPEN ELECTIVE 3	3	-	-	3	30	70
6	R18A0487	Microprocessors & Microcontrollers Lab	-	-	3	1.5	30	70
7	R18A0488	Digital Signal Processing Lab	-	-	3	1.5	30	70
8	R18A0491	Mini Project	-	-	6	3	30	70
9*	R18A0007	Constitution of India	2	-	-	-	100	-
		TOTAL	**17**	**-**	**12**	**21**	**340**	**560**

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

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 (VII Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0418	VLSI Design	3	-	-	3	30	70
2	R18A0419	Radar Systems	3	-	-	3	30	70
3	R18A0420	Microwave Engineering	3	-	-	3	30	70
4	R18A0421	Embedded System Design	3	-	-	3	30	70
5	R18A0422 R18A0423 R18A0424	1. Digital Image Processing 2. Speech and Audio Processing 3. Multimedia & Signal Coding	3	-	-	3	30	70
6	R18A0489	VLSI Design Lab	-	-	3	1.5	30	70
7	R18A0490	EM & MW Lab	-	-	3	1.5	30	70
8	R18A0492	Project-I	-	-	6	3	30	70
		TOTAL	**15**	**-**	**12**	**21**	**240**	**560**

IV Year B. Tech – II Semester (VIII Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0425	Wireless Communications & Networking	3	-	-	3	30	70
2	R18A0426 R18A0427 R18A0428	1. Detection and Estimation 2. Digital Signal Processors & Architectures 3. RF Circuit Design	3	-	-	3	30	70
3	R18A0429 R18A0430 R18A1261	1. Satellite Communications 2. Spread Spectrum Communications 3. Network Security & Cryptography	3	-	-	3	30	70
4	R18A0493	Project-II	-	-	12	6	60	140
		TOTAL	**09**	**-**	**12**	**15**	**150**	**350**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I- SEM -ECE

L	T/P/D	C
2	- / - / -	2

(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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I- SEM –ECE

L	T/P/D	C
3	1/-/-	4

(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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.TECH – I YEAR – I SEM - ECE

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

(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- ECE	L	T/P/D	C
	1	-/4-/-	3

(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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH – I- YEAR –I SEM- ECE	L	T/P/D	C
	3	-/-/-	3

(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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B. TECH – I- YEAR –I SEM- ECE	L	T/P/D	C
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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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B. TECH- I YEAR- I SEM-ECE **L T/P/D C**
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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 disinfectation-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 titrimetric and instrumental methods.

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B.TECH- I YEAR – II- SEM - ECE **L T/P/D C**

- -/3/- 1.5

(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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B.TECH- I YEAR – II- SEM - ECE **L T/P/D C**

- -/3/- 1.5

(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 - ECE

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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. Al 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

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

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.

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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(R18A0402) SIGNALS AND SYSTEMS

OBJECTIVES:

The main objectives of the course are:

1. Knowledge of time-domain representation and analysis concepts of basic elementary signals
2. Knowledge of Fourier Series for Continuous Time Signals
3. Knowledge of frequency-domain representation and analysis concepts F.T., L.T. & Z.T and Concepts of the sampling process.
4. Mathematical and computational skills needed to understand the principal of Linear System and Filter Characteristics of a System.
5. Mathematical and computational skills needed to understand the concepts of auto correlation and cross correlation and power Density Spectrum.

UNIT I:

INTRODUCTION TO SIGNALS: Elementary Signals- Continuous Time (CT) signals, Discrete Time (DT) signals, Classification of Signals, Basic Operations on signals.

FOURIER SERIES: Representation of Fourier series, Continuous time periodic signals, Dirichlet's conditions, Trigonometric Fourier Series, Exponential Fourier Series, Properties of Fourier series, Complex Fourier spectrum.

UNIT II:

FOURIER TRANSFORMS: Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Properties of Fourier transforms.

SAMPLING: Sampling theorem **–** Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing.

UNIT III:

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Introduction to Systems, Classification of Systems, Linear Time Invariant (LTI) systems, impulse response, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, System bandwidth, Ideal LPF, HPF and BPF characteristics.

UNIT IV:

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain, Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between convolution and correlation.

UNIT V:

LAPLACE TRANSFORMS: Review of Laplace transforms, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, Properties of L.T's relation between L.T's, and F.T. of a signal.

Z–TRANSFORMS: Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms, Region of convergence in Z-Transform, Inverse Z-Transform, Properties of Z-transforms.

TEXT BOOKS:

1. "Signals & Systems", Special Edition – MRCET, McGraw Hill Publications, 2017
2. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
3. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.
4. Signals and Systems – A. Anand Kumar, PHI Publications, 3rd edition.

REFERENCE BOOKS:

1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2nd Edition.
2. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
3. Fundamentals of Signals and Systems Michel J. Robert, MGH International Edition, 2008.
4. Signals, Systems and Transforms - C. L. Philips, J. M. Parr and Eve A. Riskin, Pearson education.3rd Edition, 2004.

OUTCOMES:

After completion of the course, the student will be able to:

1. Understand the basic elementary signals
2. Determine the Fourier Series for Continuous Time Signals
3. Analyze the signals using F.T, L.T & Z.T and study the properties of F.T., L.T. & Z.T.
4. Understand the principal of Linear System and Filter Characteristics of a System.
5. Understand the concepts of auto correlation and cross correlation and power Density Spectrum.

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(R18A0403) SWITCHING THEORY AND LOGIC DESIGN

OBJECTIVES

This course provides in-depth knowledge of switching theory and the logic design techniques of digital circuits, which is the basis for design of any digital circuit. The course objectives are:

1. To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
2. To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
3. To implement simple logical operations using combinational logic circuits
4. To design combinational logic circuits, sequential logic circuits.
5. To impart to student the concepts of sequential circuits, enabling them to analyze sequential systems in terms of state machines.

UNIT -I:

Number System and Boolean Algebra and Switching Functions:

Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes, Hamming Code.

Boolean Algebra:

Basic Theorems and Properties, Switching Functions, Canonical and Standard Forms, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Logic Gates. Multilevel NAND/NOR realizations.

UNIT -II:

Minimization and Design of Combinational Circuits:

K- Map Method, up to Five variable K- Maps, Don't Care Map Entries, Prime and Essential prime Implications, Quine Mc Cluskey Tabular Method, Combinational Design, Arithmetic Circuits, Comparator, decoder, Encoder, Multiplexers, DeMultiplexers, Code Converters.

UNIT -III:

Sequential Machines Fundamentals:

Introduction, Basic Architectural Distinctions between Combinational and Sequential circuits, classification of sequential circuits, The binary cell, The S-R-Latch Flip-Flop The D-Latch Flip-Flop, The "Clocked T" Flip-Flop, The " Clocked J-K" Flip-Flop, Design of a Clocked Flip-Flop, Conversion from one type of Flip-Flop to another, Timing and Triggering Consideration.

UNIT -IV:

Sequential Circuit Design and Analysis:

Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, Design Aspects, State Reduction,

Design Steps, Realization using Flip-Flops Counters - Design of Ripple Counter, Synchronous counter, Ring Counter, Registers, Shift Register**.**

UNIT -V:

Sequential Circuits:

Finite state machine- capabilities and limitations ,Mealy and Moore models, , minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.

Algorithmic State Machines:

Salient features of the ASM chart-Simple examples- Weighing machine and Binary multiplier.

TEXT BOOKS:

1. Digital Design- Morris Mano, PHI, 3rd Edition.
2. Switching Theory and Logic Design-A. Anand Kumar, PHI, 2nd Edition.
3. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

REFERENCE BOOKS:

1. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.
2. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.
3. Switching Theory and Logic Design – Bhanu Bhaskara –Tata McGraw Hill Publication, 2012
4. Fundamentals of Logic Design- Charles H. Roth, Cengage LEanring, 5th, Edition, 2004.
5. Digital Logic Applications and Design- John M. Yarbrough, Thomson Publications, 2006. 6. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

OUTCOMES

Upon completion of the course, student should possess the following skills:

1. Be able to manipulate numeric information in different forms
2. Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
3. Be able to design and analyze small combinational circuits and to use standard combinational functions to build larger more complex circuits.
4. Be able to design and analyze small sequential circuits and to use standard sequential functions to build larger more complex circuits.

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(R18A0404) PROBABILITY THEORY AND STOCHASTIC PROCESS

OBJECTIVES:

1. To provide mathematical background and sufficient experience so that student can read, write and understand sentences in the language of probability theory.
2. To introduce students to the basic methodology of "probabilistic thinking" and apply it to problems.
3. To understand basic concepts of Probability theory and Random Variables, how to deal with multiple Random Variables.
4. To understand the difference between time averages statistical averages.
5. To teach students how to apply sums and integrals to compute probabilities, and expectations.

UNIT I:

Probability and Random Variable

Probability: Set theory, Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem, and Independent Events, Bernoulli's trials.

The Random Variable: Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable

UNIT II:

Distribution and density functions and Operations on One Random Variable

Distribution and density functions: Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Exponential Gaussian, Rayleigh and Conditional Distribution, Methods of defining Conditioning Event, Conditional Density function and its properties, problems.

Operation on One Random Variable: Expected value of a random variable, function of a random variable, moments about the origin, central moments, variance and skew, characteristic function, moment generating function, transformations of a random variable, monotonic transformations for a continuous random variable, non monotonic transformations of continuous random variable, transformations of Discrete random variable

UNIT III:

Multiple Random Variables and Operations on Multiple Random Variables

Multiple Random Variables: Vector Random Variables, Joint Distribution Function and Properties, Joint density Function and Properties, Marginal Distribution and density Functions, conditional Distribution and density Functions, Statistical Independence, Distribution and density functions of Sum of Two Random Variables and Sum of Several Random Variables, Central Limit Theorem - Unequal Distribution, Equal Distributions

Operations on Multiple Random Variables: Expected Value of a Function of Random Variables, Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, and Jointly Gaussian Random Variables: Two Random Variables case and N Random Variable case, Properties, Transformations of Multiple Random Variables

UNIT VI:

Stochastic Processes-Temporal Characteristics: The Stochastic process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Statistical Independence and concept of Stationarity: First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity, Nth-Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions and its properties, Gaussian Random Processes.

Linear system Response: Mean and Mean-squared value, Autocorrelation, Cross-Correlation Functions.

UNIT V:

Stochastic Processes-Spectral Characteristics: The Power Spectrum and its Properties, Relationship between Power Spectrum and Autocorrelation Function, the Cross-Power Density Spectrum and Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Spectral characteristics of system response: power density spectrum of response, cross power spectral density of input and output of a linear system

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles -Peyton Z. Peebles, TMH, 4th Edition, 2001.
2. Probability and Random Processes-Scott Miller, Donald Childers,2Ed,Elsevier,2012

REFERENCE BOOKS:

1. Theory of probability and Stochastic Processes-Pradip Kumar Gosh, University Press
2. Probability and Random Processes with Application to Signal Processing - Henry Stark and John W. Woods, Pearson Education, 3rd Edition.
3. Probability Methods of Signal and System Analysis- George R. Cooper, Clave D. MC Gillem, Oxford, 3rd Edition, 1999.
4. Statistical Theory of Communication -S.P. Eugene Xavier, New Age Publications 2003
5. Probability, Random Variables and Stochastic Processes Athanasios Papoulis and S.Unnikrishna Pillai, PHI, 4th Edition, 2002.

OUTCOMES:

Upon completion of the subject, students will be able to compute:

1. Simple probabilities using an appropriate sample space.
2. Simple probabilities and expectations from probability density functions (pdfs)
3. Likelihood ratio tests from pdfs for statistical engineering problems.
4. Least -square & maximum likelihood estimators for engineering problems.
5. Mean and covariance functions for simple random processes.

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(R18A0405) NETWORK ANALYSIS & TRANSMISSION LINES

OBJECTIVES

This course introduces

1. The basic concepts of transient analysis of the circuits,
2. The basic two-port network parameters, design analysis of the filters and attenuators and their use in the circuit theory,
3. Analysis of the locus diagrams, resonance, magnetic circuits.
4. The emphasis of this course is laid on the basic operation of DC machines which includes DC generators and DC motors.

UNIT - I:

Transient Analysis (First and Second Order Circuits): Introduction to transient response and steady state response, Transient response of series -RL, RC RLC Circuits for sinusoidal, square, ramp and pulse excitations, Initial Conditions, Solution using Differential Equations approach and Laplace Transform method,

UNIT - II:

Two Port Networks: Impedance Parameters, Admittance Parameters, Hybrid Parameters, Transmission (ABCD) Parameters, Conversion of one of parameter to another, Conditions for Reciprocity and Symmetry, Interconnection of two port networks in Series, Parallel and Cascaded configurations, Image Parameters, Illustrative problems.

UNIT-III:

Locus diagrams, Resonance and Magnetic Circuits: Locus diagrams – Series and Parallel RL, RC, RLC circuits with variation of various parameters - Resonance-Series and Parallel circuits, Concept of band width and quality factor.

Magnetic Circuits- Faraday's laws of electromagnetic induction, Concept of self and mutual inductance, Dot convention, Coefficient of coupling, Composite magnetic circuits, Analysis of series and parallel magnetic circuits.

UNIT - IV:

Transmission Lines - I: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristics Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion - Condition for Distortionlessness and Minimum Attenuation, Illustrative Problems.

UNIT V:

Transmission Lines - II: SC and OC Lines, Input Impedance Relations, Reflection Coefficient, VSWR, λ/4, λ 2, λ /8 Lines - Impedance Transformations, Significance of Zmin and Zmax, Smith Chart - Configuration and Applications, Single Stub Matching, Illustrative Problems.

TEXT BOOKS:

1. Electrical Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
2. Network Analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. A Text book of Electrical Technology by B.L Theraja and A.K Theraja, S.Chand publications
4. Basic Concepts of Electrical Engineering - PS Subramanyam, BS Publications.
5. Transmission Lines and Networks - Umesh Sinha, Satya prakashan, 2001, (Tech. India Publications), New Delhi.

REFERENCE BOOKS:

1. Engineering Circuits Analysis - William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 7th Edition.
2. Basic Electrical Engineering - S.N. Singh PUI.
3. Electrical Circuits - David A. Bell, Oxford Printing Press.
4. Principles of Electrical Engineering by V.K Mehta, Rohit Mehta, S.Chand publications.
5. Electrical Circuit Analysis - K.S. Suresh Kumar, Pearson Education.

OUTCOMES:

After going through this course the student gets a

1. Thorough knowledge on Transient analysis of the circuits, filters, attenuators
2. The operation of DC machines
3. Apply the above conceptual things to real world problems and applications

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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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(R18A0482) BASIC SIMULATION LAB

Note:

1. All the experiments are to be simulated using MATLAB or equivalent software
2. Minimum of 15 experiments are to be completed

List of experiments:

1. Basic operations on matrices.
2. Generation on various signals and Sequences (periodic and aperiodic), such as unit impulse, unit step, square, sawtooth, triangular, sinusoidal, ramp, sinc.
3. Operations on signals and sequences such as addition, multiplication, scaling, shifting, folding, computation of energy and average power.
4. Finding the even and odd parts of signal/sequence and real and imaginary part of signal.
5. Convolution between signals and sequences.
6. Auto correlation and cross correlation between signals and sequences.
7. Verification of linearity properties of a given continuous /discrete system.
8. Verification of time invariance properties of a given continuous discrete system.
9. Computation of unit sample, unit step and sinusoidal response of the given LTI system and verifying its physical Realizability and stability properties.
10. Gibbs phenomenon.
11. Finding the Fourier transform of a given signal and plotting its magnitude and phase spectrum.
12. Locating the zeros and poles and plotting the pole zero maps in s-plane and z-plane for the given transfer function.
13. Generation of Gaussian Noise (real and complex), computation of its mean, M.S. Value and its skew, kurtosis, and PSD, probability distribution function.
14. Sampling theorem verification.
15. Removal of noise by auto correlation/cross correlation.
16. Verification of Weiner-Khinchine relations.
17. Checking a random process for stationary in wide sense.

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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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(R18A0210) CONTROL SYSTEMS

OBJECTIVES

In this course it is aimed to

1. Introduce the principles and applications of control systems in everyday life.
2. The basic concepts of block diagram reduction, transfer function representation, time response and time domain analysis, solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

UNIT - I:

Introduction: Concept of control system, Classification of control systems - Open loop and closed loop control systems, Differences, Examples of control systems- Effects of feedback, Feed Back Characteristics. Mathematical models for mechanical systems – Differential equations and transfer functions. Analogous systems-Force–Voltage and Force-Current analogy.

Transfer Function Representation: Block diagram algebra, Block diagram representation for mechanical and electrical systems, Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT - II:

Time Response Analysis: Standard test signals, Time response of first order systems, Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications, Steady state response, Steady state errors and error constants.PID controllers, Effects of proportional derivative, proportional integral systems on steady state error.

UNIT - III:

Stability Analysis in S-Domain: The concept of stability – Routh-Hurwitz's stability criterion – qualitative stability and conditional stability – Limitations of Routh-Hurwitz's stability.

Root Locus Technique: Concept of root locus - Construction of root locus, Effects of adding poles and zeros to G(s) H(s) on the root loci.

UNIT - IV:

Frequency Response Analysis: Introduction, Frequency domain specifications, Bode plot diagrams-Determination of Phase margin and Gain margin, Stability analysis from Bode plots. Polar plots- Nyquist plots, Stability analysis. Compensation techniques – Lag, Lead, Lead-Lag and Lag-Lead Controllers design in frequency Domain.

UNIT - V:

State Space Analysis of Continuous Systems: Concepts of state, state variables and state model, Derivation of state models from block diagrams, Diagonalization, Solving the time

invariant state equations, State Transition Matrix and it's properties, Concepts of Controllability and Observability.

TEXT BOOKS:

1. Control Systems Engineering - I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers.
2. Control Systems - A. Ananad Kumar, PHI.
3. Control Systems Engineering by A. Nagoor Kani, RBA Publications.

REFERENCE BOOKS:

1. Control Systems Theory and Applications - S. K. Bhattacharya, Pearson.
2. Control Systems Engineering - S. Palani, TMH.
3. Control Systems - N. K. Sinha, New Age International (P) Limited Publishers.
4. Control Systems by S.Hasan Saeed, KATSON BOOKS.
5. Solutions and Problems of Control Systems by A.K. Jairath, CBS Publishers.

OUTCOMES

After going through this course, the student gets

1. A thorough knowledge on open loop and closed loop control systems, concept of feedback in control systems.
2. Transfer function representation through block diagram algebra and signal flow graphs.
3. Time response analysis of different ordered systems through their characteristic equation.
4. Time domain specifications, stability analysis of control systems in s-domain through R-H criteria.
5. Root locus techniques, frequency response analysis through Bode diagrams, Nyquist, Polar plots.

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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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(R18A0407) ELECTROMAGNETIC FIELDS & WAVES

OBJECTIVES

The course objectives are:

1. To introduce the student to the coordinate system and its implementation to electromagnetics.
2. To elaborate the concept of electromagnetic waves and their practical applications.
3. To study the propagation, reflection, and transmission of plane waves in bounded unbounded media.
4. To understand basic concepts of antenna.

UNIT - I:

Electrostatics: Basics of coordinate system, Coulomb's Law, Electric Field Intensity - Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Equations for Electrostatic Fields, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Illustrative Problems.

UNIT - II:

Magnetostatics: Biot - Savart's Law , Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields,Illustrative Problem.

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, Displacement Current Density, Maxwell's Equations in Differrent Final Forms, Conditions at a Boundry Surface: Dielectric - Dielectric, Illustrative Problems.

UNIT - III:

EM Wave Characteristics-I : Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves - Definition, Relation Between E & H, Wave Propagation in Lossless and Conducting Media, Wave Propagation in Good Conductors and Good Dielectrics, Illustrative Problems.

UNIT - IV:

EM Wave Characteristics - II: Reflection and Refraction of Plane Waves - Normal for both perfect Conductors and perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem - Applications, Power Loss in a Plane Conductor., Illustrative Problems.

UNIT-V:

Waveguides & Resonators: Introduction, Microwave spectrum and bands, applications of Microwaves, Rectangular Waveguides-Solution of Wave Equation in Rectangular Coordinates, TE/TM mode analysis, Expressions for fields, Cutoff frequencies, filter

characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross-section, Mode characteristics - Phase and Group velocities, wavelengths and impedance relations, Rectangular Waveguides – Power Transmission and Power Losses, Impossibility of TEM Modes, losses, Q-factor, Cavity resonators-introduction, Rectangular and cylindrical cavities, dominant modes and resonant frequencies, Q-factor and coupling coefficients, Illustrative Problems.

TEXT BOOKS:

1. Elements of Electromagnetics - Matthew N. O. Sadiku, 4th., Oxford Univ. Press.
2. Electromagnetic Waves and Radiating Systems - E.C. Jordan and K. G. Balmain, 2nd Ed., 2000, PHI.
3. Antenna and wave propagation - J.D.Kraus , R.J.Marhefka and Ahmad S. Khan , TMH , New Delhi, 4Th ed.,(Special Indian Edition),2010.
4. Microwave Devices and Circuits – Samuel Y. Liao, PHI, 3rd Edition,1994.

REFERENCES BOOKS:

1. Engineering Electromagnetics - Nathan Ida, 2nd Ed., 2005, Springer (India) Pvt. Ltd., New Delhi.
2. Engineering Electromagnetics - William H. Hay Jr. and John A. Buck, 7th Ed., 2006, TMH.
3. Electromagnetics Fields Theory and Transmission Lines - G. Dashibhushana Rao, Wiley India, 2013.
4. Antenna and wave propagation - K.D.Prasad , Satya Prakashan , Tech India Publications, New Delhi, 2001
5. Antenna – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed.1988.

OUTCOMES

Upon the successful completion of the course, students will be able to;

1. Study time varying Maxwell equations and their applications in electromagnetic problems
2. Determine the relationship between time varying electric and magnetic field and electromotive force
3. Use Maxwell equation to describe the propagation of electromagnetic waves in vaccum
4. Show how waves propagate in dielectrics and lossy media
5. Demonstrate the reflection and refraction of waves at boundaries

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(R18A0408) ANALOG COMMUNICATIONS

OBJECTIVES

1. Emphasize on the study of principles of communication theory.
2. Focus on the fundamentals of communication system.
3. Introduce the techniques of transmitting and receiving information signals using analog carrier modulation techniques (AM, FM, PM) and evaluate their performance levels (SNR) in the presence of channel noise.
4. Establish foundation for understanding the relationship among various technical factors useful in the design & operation of a communication system.

UNIT I

AMPLITUDE MODULATION: Introduction to communication system, Need for modulation, Frequency Division Multiplexing, Amplitude Modulation: Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves: square law Modulator, Switching modulator, Detection of AM Waves: Square law detector, Envelope detector.

DSB-SC modulation: Double side band suppressed carrier modulation, time domain and frequency domain description, Generation of DSBSC Waves: Balanced Modulators, Ring Modulator, Detection of DSBSC waves: Coherent detection, COSTAS Loop.

Radio Transmitters- Classification of Transmitters, AM Transmitter Block diagram and explanation of each block.

UNIT II

SSB MODULATION: Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Hilbert Transform & its Properties, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves.

Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelope detection of a VSB Wave plus Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT III

ANGLE MODULATION: Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave. Generation of FM Waves: Indirect FM, Direct FM: Varactor Diode and Reactance Modulator. Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM & AM. , Pre-emphasis & de-emphasis, FM Transmitter block diagram and explanation of each block.

UNIT IV

NOISE: Noise in communication System, White Noise, Narrowband Noise –In phase and Quadrature phase components. Noise Bandwidth, Noise Figure, Noise Temperature, Noise in DSB& SSB System Noise in AM System, Noise in Angle Modulation System, and Threshold effect in Angle Modulation System.

UNIT V

RECEIVERS: Radio Receiver, Receiver Types: Tuned radio frequency receiver, Superhetrodyne receiver- RF section, Frequency mixers, tracking, Intermediate frequency, AGC. Receiver Parameters & Characteristics, FM Receiver and its comparison with AM Receiver.

PULSE MODULATION: Types of Pulse modulation, PAM: Generation (Single polarity, double polarity) and Demodulation. PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM.

TEXTBOOKS:

1. Communication Systems- Simon Haykin, 2nd Edition, Wiley Publications.
2. Communication Systems – B.P. Lathi, BS Publication, 2006.
3. Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe, TMH, 2007 3rd Edition.

REFERENCES:

1. Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004.
2. Communication Systems Second Edition – R.P. Singh, SP Sapre, TMH, 2007.
3. Analog & Digital Communication – K.Sam Shanmugam, Wiley 2005
4. Fundamentals of Communication Systems - John G. Proakis, Masond, Salehi PEA, 2006.
5. Electronic Communication Systems- Modulation & Transmission- Robert J.Schoenbeck, 2nd Edition, PHI.

OUTCOMES

1. Upon completion of the subject, students will be able:
2. Conceptually understand the baseband signal and system
3. Identify various elements, processes and parameters in telecommunication systems and describe their functions, effects and inter relationship
4. Design procedure of AM transmission and reception, analyze, measure and evaluate the performance of the telecommunication system against given criteria.
5. Understand basic knowledge of FM transmission and reception Design typical telecommunication systems that consists of basic and essential building blocks

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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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(R18A0483) ANALOG CIRCUITS LAB

PART - I: ELECTRONIC CIRCUITS

Minimum eight experiments to be conducted:

I) Design and Simulation in Simulation Laboratory using any Simulation Software.
(Minimum 6 Experiments):

1. Common Emitter Amplifier.
2. Common Source Amplifier.
3. Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Feedback Amplifier
5. Cascade Amplifier.
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. Common base (BJT) / Common gate(JFET) Amplifier.

II) Testing in the Hardware Laboratory (Minimum 2 Experiments):

1. Class A Power Amplifier (with transformer load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitt's Oscillators
5. Darlington Pair
6. MOS Common Source Amplifier

Equipments required for Laboratories:

1. For software simulation of Electronic circuits
   i. Computer Systems with latest specifications
   ii. Connected in LAN (Optional)
   iii. Operating system (Windows XP)
   iv. Suitable Simulations software
2. For Hardware simulations of Electronic Circuits
   i. Regulated Power Supply (0-30V)
   ii. CROs
   iii. Functions Generators
   iv. Multimeters
   v. Components
3. Windows XP/ Linux etc.

PART - II: PULSE CIRCUITS

Minimum eight experiments to be conducted:

1. Linear Wave Shaping.
   a. RC Low Pass Circuit for different time constants.
   b. RC High Pass Circuit for different time constants.

2. Non - Linear Wave Shaping.
    a. Transfer Characteristics and response of Clippers:
        i. Positive and Negative Clippers
        ii. Clipping at two independent levels
    b. The Steady state output waveform of clsmpers for a square wave input
        i. Positive and Negative Clampers
        ii. Clamping at reference voltage
3. Comparison Operation of Comparators
4. Switching characteristics of a transistor
5. Design a Bistable Multivibrator and draw its waveforms
6. Design a Astable Multivibrator and draw its waveforms
7. Design a Monostable Multivibrator and draw its waveforms
8. UJT relaxation Oscillator

Equipment required for Laboratories:

1. Regulated Power Supply (0-30V)
2. CROs
3. Functions Generators
4. Multimeters
5. Components

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(R18A0484) ANALOG COMMUNICATIONS LAB

Note: Minimum 12 Experiments should be conducted:
All these experiments are to be simulated first using MATLAB, Comsim or any other simulation package and then to be realized in hardware.

LIST OF EXPERIMENTS:

1. Amplitude modulation and demodulation.
2. DSB-SC Modulator & Detector.
3. SSB-Sc Modulator & Detector (Phase Shift Method).
4. Frequency modulation and demodulation.
5. Study of spectrum analyzer and analysis of AM and FM Signals.
6. Pre-emphasis & de-emphasis.
7. Frequency Division Multiplexing & De multiplexing.
8. Verification of Sampling Theorem.
9. Pulse Amplitude Modulation & Demodulation.
10. Pulse Width Modulation & Demodulation.
11. Pulse Position Modulation & Demodulation.
12. Frequency Synthesizer.
13. AGC Characteristics.
14. PLL as FM Demodulator.

Equipment required for the Laboratory:

1. RPS - 0-30 V.
2. CRO - 0-20 M Hz.
3. Function Generators - 0-1 M Hz.
4. RF Generators - 0-1000 M Hz./0-100 MHz.
5. Multimeters.
6. Lab Experimental kits for Analog Communication.
7. Radio Receiver/TV Receiver Demo kits or Trainees.
8. Spectrum Analyzer – 60 M Hz.
9. Any one Simulation Package.

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	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

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	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.

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	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.

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	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

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	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 .

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	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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	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.

MODEL QUESTION PAPERS

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 grow.
ii. A gentleman opens the door for a lady.
iii. He loves to read in the library.
iv. He slept.
v. He kept 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]

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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

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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 $\frac{\partial(x, y, z)}{\partial(u, v, w)}$. [7M]

b) Expand $x^2y + 3y - 2$ 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 $(D^2 - 2D + 1)y = x^2e^{3x} - \sin 2x + 3$. [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 $1\frac{1}{2}$

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 $L\{\int_0^t te^{-t} sin4tdt\}$ [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 $\int_0^\infty te^{-t} sintdt$ [4M]

c) State and prove Convolution theorem? [6M]

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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 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 $\frac{\partial(x,y)}{\partial(r,\theta)}.\frac{\partial(r,\theta)}{\partial(x,y)} = 1$ [10M]

SECTION-III

Q. No. 5 a) Solve $\left(1+e^{\frac{x}{y}}\right)dx + e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy = 0$ [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 cos2t 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 $i) \int_0^\infty te^t \sin t \, dt$ = $\frac{3}{50}$ [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 $y'' + 2y' - 3y = \sin t$ using laplace transform given that $y = \frac{dy}{dt} = 0$ when $t = 0$ [10M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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. [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 $x^2p^2 + xpq = z^2$ [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
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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) 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

(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 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
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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 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 insulators. [6M]

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

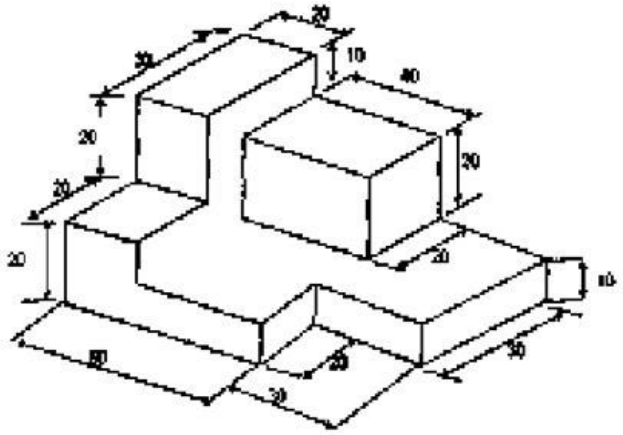
Q.NO: 7 Draw the isometric view of a hexagonal prism of base side 30 mm and axis 70mm. the prism is resting on its base on the H.P. with an edge of the base parallel to the V.P. [14 M]

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

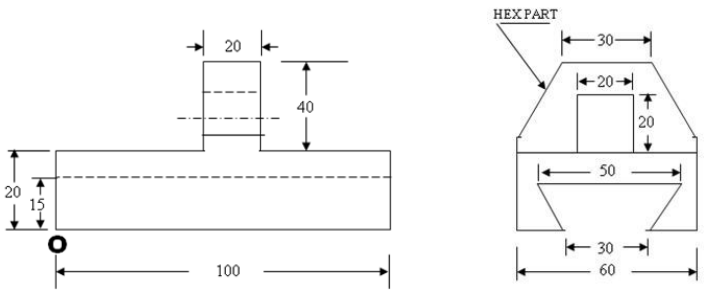
Q.NO: 9 Draw the orthographic projections for the pictorial view shown in figure All dimensions are in mm [14 M]



OR

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

[14 M]



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 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 eccentricity as 3/2. Draw a tangent and normal to the curve at a point that is 35 mm from the focus. [10M]

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 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. [14M]

SECTION III

Q.NO: 5 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, front and left side views. [14M]

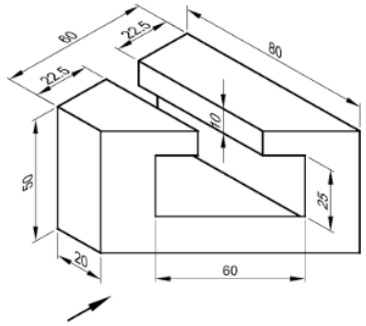
OR

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

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

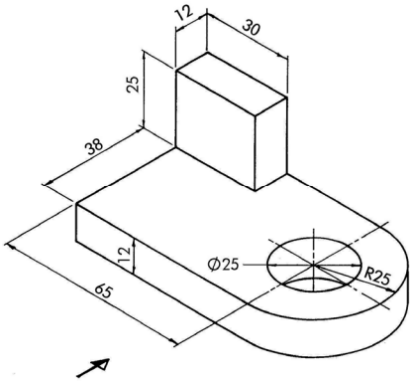
SECTION IV

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

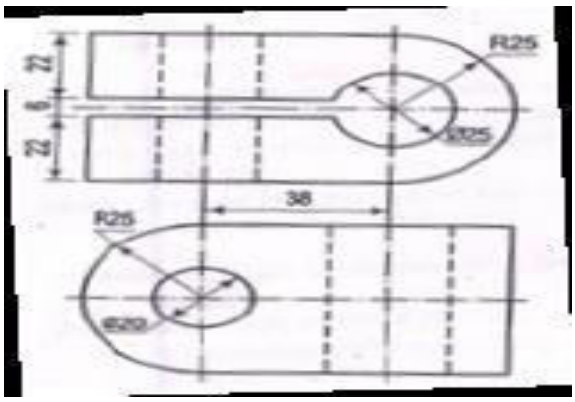


OR

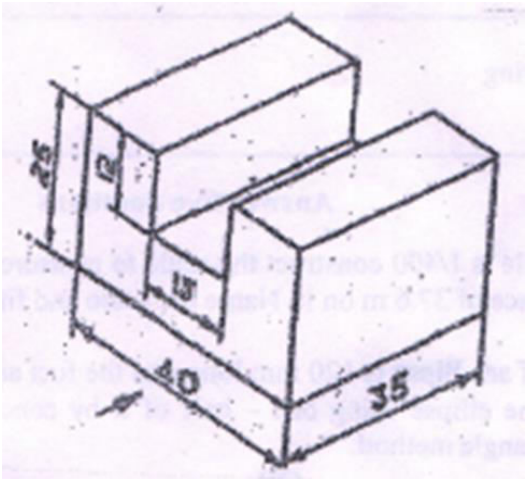
Q.NO: 8 Draw three views of the following component in first angle projection. Take all dimensions are in mm.



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

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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(a) Draw a plain scale of R.F 1:40 to read Metres and Decimetres and long enough to measure upto 8*m*. Show lengths of 4.3*m* and 6.2*m* on this scale. [7M]

(b) Draw the hyperbola when the focus and the vertex are 25*mm* 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 50*mm* diameter rolls on the circumference of another circle of 175*mm* 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 125*mm* 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 35*mm* 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 30*mm* and height 70*mm* 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 30*mm* 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 40*mm* 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]

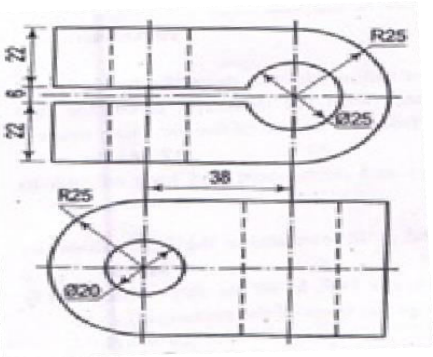

Figure 1

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

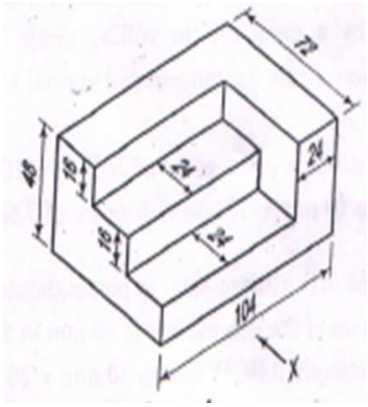

Figure 2

OR

Q.NO: 10 Draw the elevation, plan and side view of the picture shown in the Figure 3. [14M]

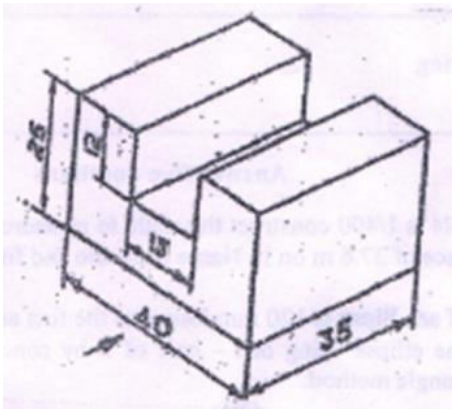

Figure 3

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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]

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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

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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
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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

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SECTION-I

Q.NO: 1 a) Find a root of an equation $3x = cosx + 1$ 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 $\beta(m,n)=\frac{(m-1)!(n-1)!}{(m+n-1)!}$ [7+7M]

SECTION-IV

Q.NO: 7 a) Change the order of integration and evaluate $=\int_0^a\int_{x/a}^{\sqrt{x/a}}\left(x^2+y^2\right)dx\,dy$

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 $\int_0^1\int_{x^2}^{2-x}xydxdy$ and hence evaluate the double integral.

b) Evaluate the integral by changing to polar co-ordinates $\int_0^a\int_0^{\sqrt{a^2-y^2}}\left(x^2+y^2\right)dx\,dy$ [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 $\int\int_s \bar{F}.\bar{n}ds$ where $\bar{F}=2x^2y\bar{i}-y^2\bar{j}+4xz^2\bar{k}$ 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
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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

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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 sinx = 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 $\overline{|(n)} = \int_0^1 \left(\log 1/x\right)^{n-1} dx, n > 0$

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 $\int_0^1 x^m \left(\log x\right)^n dx = \frac{(-1)^n\, n!}{(m+1)^{n+1}}$

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 $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

b)*Evaluate* $\int_0^{\pi/4}\int_0^{a\sin\theta} \frac{r\,dr\,d\theta}{\sqrt{a^2-r^2}}$ [7+7M]

SECTION-V

Q.NO: 9 a) If =(5xy-6x^2) $\bar{i}$ +(2y-4x) $\bar{j}$, evaluate $\int_C \bar{F}\cdot d\bar{r}$ along the curve C in xy-plane y=x^{3}from (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 $x^2\bar{\imath} - y^2\bar{j}$+ 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]

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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 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 $2^{2n-1}\lceil(n)\left\lceil\left(n+\frac{1}{2}\right)\right. = \lceil(2n).\sqrt{\pi}$

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 $\overline{F} = (x^2-y^2)\bar{i}+2xy\bar{j}$ over the box bounded by planes x=0,x=a ,y=0,y=b. [14M])

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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

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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]

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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]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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) 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]

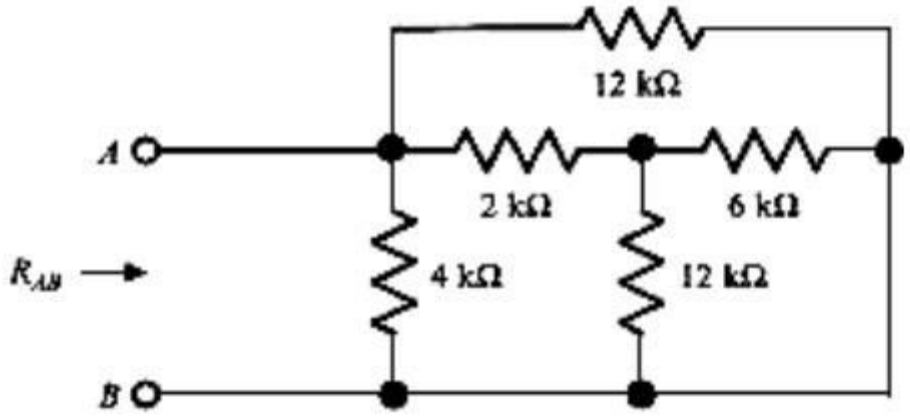


Figure: 1

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]

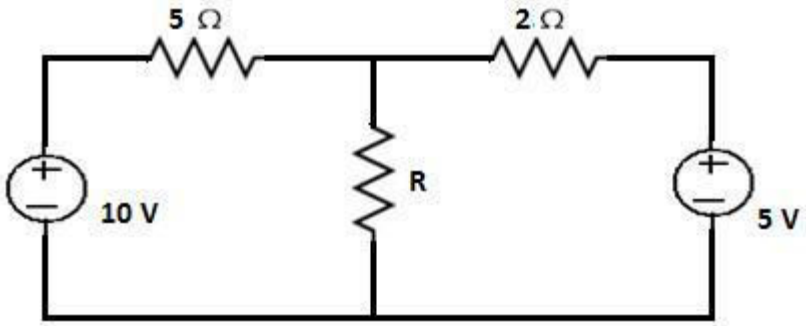
SECTION II

Q.NO: 3 a) Write short notes on Star – Delta transformation. [7M]

b) With an example, explain in detail about Nodal analysis. [7M]

OR

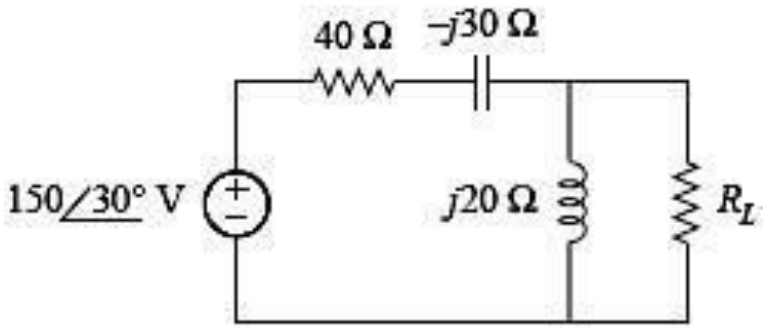
Q.NO: 4 a) Using maximum power transfer theorem, determine the maximum power that is delivered to the unknown resistor R in the circuit below. [7M]



b) Determine current flowing through 3ohms resistor using Super mesh analysis. [7M]

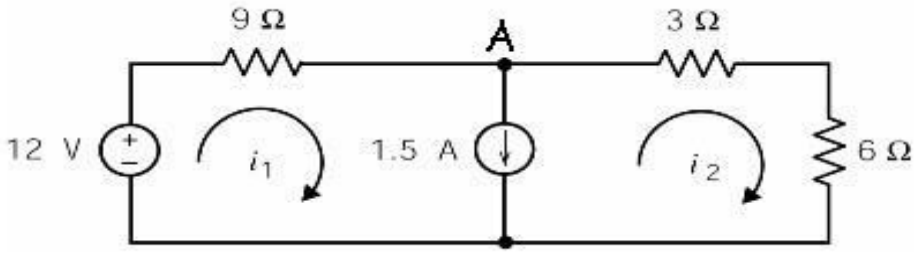
SECTION III

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]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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 independent and dependent sources with neat sketch [7M]

b) State & Explain Kirchhoff's laws with example. [7M]

OR

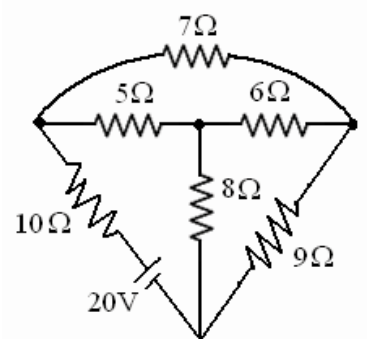
Q.NO: 2 a) Write about source transformation with neat diagrams [7M]

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]

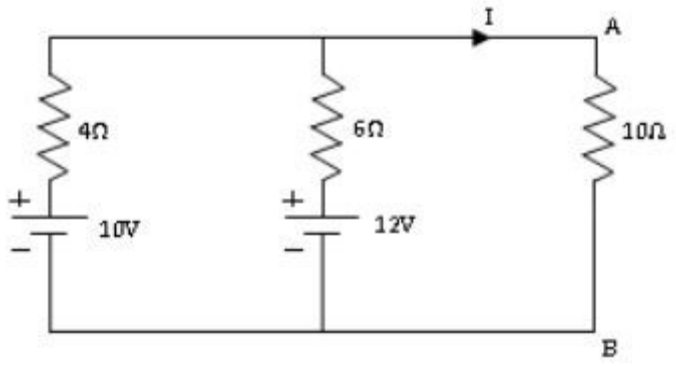
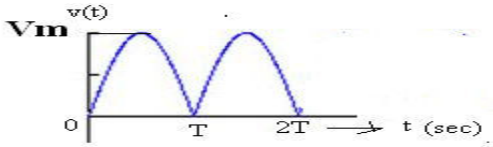


Figure: 1

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]

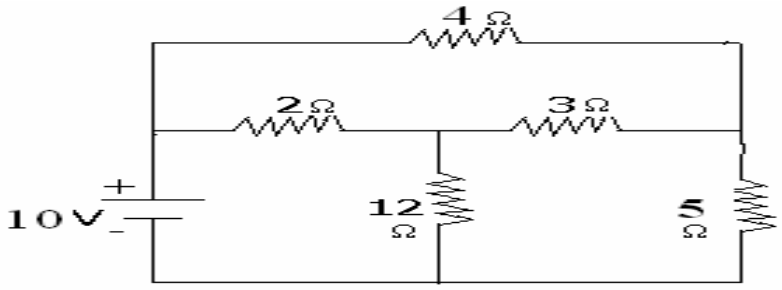
OR

Q.NO: 2 a) State & Explain Kirchhoff's laws with example. [7M]

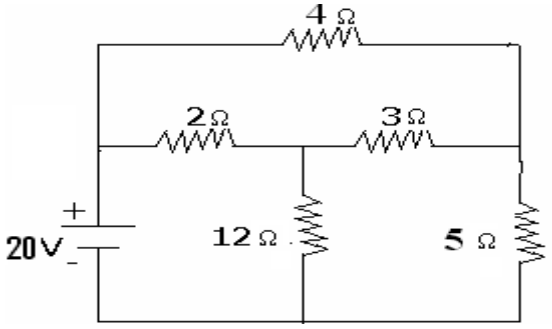
b) Explain about source transformation technique with neat diagrams. [7M]

SECTION II

Q.NO:3 a)Find out the power absorbed by the 5 ohm resistor by using nodal analysis. [7M]



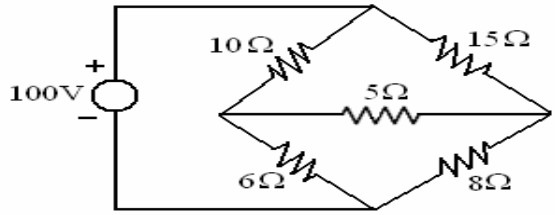
b) Find the current supplied by 10 V battery by using Star – Delta transformation for the following network. [7M]



(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 & Circuits
3	R18A0402	Signals & Systems
4	R18A0403	Switching Theory & Logic Design
5	R18A0404	Probability Theory & Stochastic Process
6	R18A0405	Network Analysis & Transmission Lines

R18

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<2π. [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 $e^{-ax} - e^{-bx} = \frac{2\left(b^2 - a^2\right)}{\pi}\int_0^\infty \frac{\lambda \sin \lambda x}{\left(\lambda^2 + a^2\right)\left(\lambda^2 + b^2\right)} d\lambda, a > 0, b > 0$

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]

R18

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 $\sum_{n=1}^{\infty}\frac{1}{(2n-1)^2}=\frac{\pi^2}{8}$ [14M]

OR

2. Expand $f(x)=e^x, -\pi<x<\pi$ as a Fourier series. Derive a series for $\frac{\pi}{sinh\pi}$ [14M]

SECTION-II

3. Find the Fourier sine transform of $\frac{x}{a^2+x^2}$ and Fourier cosine transform of $\frac{1}{a^2+x^2}$ [14M]

OR

4. Find Fourier sine and cosine transforms $f(x)=\frac{e^{-ax}}{x}$ and deduce that [14M]

$$\int_0^{\infty}\frac{e^{-ax}-e^{-bx}}{x}\sin sx\,dx=\tan^{-1}\left(\frac{s}{a}\right)-\tan^{-1}\left(\frac{s}{b}\right)$$

SECTION-III

5. a. Evaluate $\int_C \frac{z+4}{z^2+2z+5}dz$, $where\ c: |z+1-i|=2$. [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 $\frac{1}{z^2-4z+3}$ for $1<|z|<3$. [7M]

b. Find the Taylor's Series of e^z about z = 3. [7M]

OR

8. Evaluate $\int_C \frac{z-3}{z^2+2z+5}dz$, 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 = $\frac{4}{z}$ 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]

R18

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 $f(x) = xsinx$ 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 $\int_0^\infty \frac{sinx - cosx}{x^3} \, dx = \frac{\pi}{4}$

[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]

R18

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: 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

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 a Center 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? Explain its significance. [7]
Find the Q-point of self-bias transistor circuit with the following specifications: $V_{CC} = 22.5V$, $R_L = 5.6k\Omega$, $R_C = 1k\Omega$, $R_I = 90k\Omega$, $R_2 = 10k\Omega$, $V_{BE} = 0.7V$ and $\beta = 55$. Assume $I_B >> I_{CO}$[7]

SECTION-III

5a. Compare the three transistor amplifier configurations with related to A_i, Av, 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, $h_{re}=2.5x10^{-4}$ Calculate A_i, Av, 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

9a. Explain principal operation of Tunnel diode. [7]

9b. 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]

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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: 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

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 be constant and equal to 30Ω. The load resistance is 1KΩ. The transformer secondary voltage is 200-0-200V (rms).Calculate V_{DC}, I_{DC}, Ripple factor [7]
2b. Derive expression for FWR Rectifier i) DC load current ii) DC output voltage iii) Peak Inverse Voltage of each diode IV) Efficiency v) Ripple factor [7]

SECTION-II

3a. Draw the circuit diagram of a transistor in CE configuration and explain the output characteristics with the help of different regions. [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]

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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: 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

1a. Explain in detail, the reason for exponential rise in forward characteristic of a diode with suitable mathematical expression. [7]

1b. Explain and Derive expression for transition capacitance? [7]

(OR)

2a. Explain Full wave bridge rectifier with neat diagram? [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 transistor with $\alpha_{D.C.} = 0.99$ and $I_{CBO} = 20\mu A$ when the base current is 50μ 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 and enhancement MOSFET [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 in detail. Also explain the negative-resistance region in the characteristics and applications of Tunnel diode. [14]

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-I
SIGNALS AND SYSTEMS

Time: 3 hours **Max. Marks: 70**

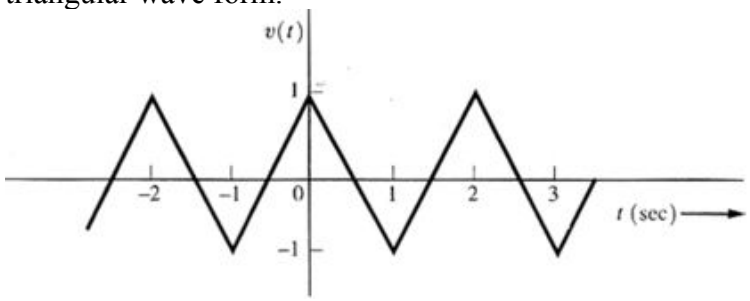
Answer one question from each section.

SECTION – I

1. (a) Write short notes on the following signals: [8M]
   (i) Unit step (ii) Unit impulse
   (iii) Unit ramp (iv)Signum function
   (b)Write the properties of Impulse function [6M]

(OR)

2. Find the exponential Fourier series and plot the magnitude and phase spectra of the following triangular wave form. [14M]



SECTION – II

3. State and prove following properties of Fourier transform.
   (i)Convolution in time domain [5M]
   (ii) Differentiation in time domain [5M]
   (iii) Time shifting [4M]

(OR)

4. a) When does aliasing occur? What is anti-aliasing filter? [6M]
   b) Explain various sampling methods? [8M]

SECTION – III

5. a) Define following properties of a continuous time system with simple examples.
   (i) Linearity and Non-linearity (ii) Time variance and Time invariance [6M]
   b) Examine the following systems with respect to above properties.
   (i) $y(t) = \sin[x(t)]$ (ii) $y(t) = \text{sint}.x(t)$ [8M]

(OR)

6. a) Explain the filter characteristics of linear systems [7M]
   b) Obtain the conditions for distortion less transmission through a system. [7M]

SECTION – IV

7. a) Explain graphical representation of convolution with example [7M]
   b) Compare energy spectral density and power spectral density. [7M]

(OR)

8. Determine and sketch auto correlation function of a periodic signal X(t)= $A \sin(\omega_0 t + \theta)$. Also sketch its power spectral density. [14M]

SECTION – V

9. State and prove initial value theorem and final value theorem with respect to Laplace transform. [14M]

(OR)

10. Prove that the sequences $x_1[n] = a^n u[n]$ and $x_2[n] = -a^n u[-n-1]$ have same Z transform and differ only in ROC. Plot their ROCs. [14M]

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-II
SIGNALS AND SYSTEMS

Time: 3 hours **Max. Marks: 70**

Answer one question from each section.

SECTION – I

1. (a) Define and discuss various elementary continuous time signals. Indicate them graphically [10M]
   (b) What are the types of representation of discrete time signals? Represent a sequence in all types. [4M]

(OR)

2. State and prove any two properties of the Fourier series. [14M]

SECTION – II

3. Obtain the Fourier transform of the following: [14M]

(OR)

4. State and prove the following properties of Fourier transform.
   (i) Multiplication in time domain. [5M]
   (ii) Linearity. [5M]
   (iii) Frequency shifting [4M]

SECTION – III

5. A continuous time signal is given as: $x(t) = 8 \cos 200\pi t$ Determine [14M]
   i.Minimum sampling rate
   ii.If fs=400Hz what is discrete time signal obtained after sampling.
   iii.If fs=150Hz what is discrete time signal obtained after sampling.

(OR)

6. Define Nyquist rate. Compare the merits and demerits of performing sampling using impulse, Natural and Flat-top sampling techniques. [14M]

SECTION – IV

7. State and Prove Properties of auto correlation and cross correlation functions? [14M]

(OR)

8. Prove that for a signal, auto correlation function and power spectral density forms a Fourier transform pair. [14M]

SECTION – V

9. Find the Laplace transform of the function

   (i) $f(t) = A \sin \omega_0 t$ for $0 < t < T/2$ [7M]
   (ii) $f(t) = e^{-at} \cos(\omega_c t + \theta)$ [7M]

(OR)

10. Find the Laplace transform of the periodic square wave of amplitude range (-A, A) and time period 2T. [14M]

$$F(s) = \frac{17s^3+7s^2+s+6}{s^5+3s^4+5s^3+4s^2+2s}$$

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-III
SIGNALS & SYSTEMS

Time: 3 hours Max Marks: 70

SECTION – I

1. (a)What are the basic operations of signals? Illustrate with an example [10M]
   (b)Distinguish between continuous-time and discrete –time signals. [4M]

(OR)

2. Derive the expressions for the trigonometric Fourier series coefficients [14M]

SECTION – II

3. (a) State and Prove Modulation theorem. [7M]
   (b)Using the modulation theorem find out the Fourier transform of RF pulse Given as $y(t) = A\ rect(t/\tau)\ Cos\ 2\pi f_c t$. [7M]

(OR)

4. Explain sampling theorem for Band limited Signals [14M]

SECTION – III

5. (a) Explain causality and physical reliability of a system and hence give Paley-Wiener criterion. [6M]
   (b) Obtain the relationship between the bandwidth and rise time of ideal low pass Filter [8M]

(OR)

6. Distinguish between linear and non linear systems with examples and Consider a stable LTI System characterized by the differential equation $dy(t)/dt + 2y(t) = x(t)$. Find its impulse response. [14M]

SECTION – IV

7. (a) The waveform $V(t)= e^{-t}/T\ u(t)$ is passed through a high pass RC circuit having a time constant T and find the energy spectral density at the output of the circuit. [7M]

   (b)Find the cross correlation of the functions sin ωt and cos ωt. [7M]

(OR)

8. (a) Write the Procedure to find the convolution of two signals. [7M]
   (b) Find the convolution of the following signals by graphical method.
   $x(t)=e^{-3t}u(t), h(t)=u(t+3)$ [7M]

SECTION – V

9. Determine the function of time x(t) for each of the following Laplace transforms and their associated regions of convergence [14M]

(OR)

10. Using the Power Series expansion technique, find the inverse Z-transform of The following X (Z) [14M]

i. $X(Z) = \frac{Z}{2Z^2-3Z+1}$ $|Z| < \frac{1}{2}$

ii. $X(Z) = \frac{Z}{2Z^2-3Z+1}$ $|Z| > 1$

(b) Find the inverse Z transform of

$X(Z) = \frac{Z}{Z(Z-1)(Z-2)^2}$ $|Z| > 2$

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MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper I

SWITCHING THEORY & LOGIC DESIGN

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) Convert the number (127.75)8 to base 10, base 3, base 16 and base 2. [6M]

b) Given that $(64)_{10} = (100)_b$, determine the value of b. [2M]

c) Perform the binary arithmetic operations on (+12)-(4) using signed 2'scomplement representation. [6M]

OR

2 a) Define the terms i) Cyclic codes ii) Reflective codes iii)Unit distance codes [7M]

b) 3. A receiver has received a message code 1110110 which is an even parity Hamming code. Determine whether the message code has any error. If so correct the error. Give proper reasoning for your answer. [7M]

SECTION-II

3 a) State and Prove the Huntington postulates of Boolean algebra. [5M]

b) Find the complement of the function and represent in sum of minterms

F = xy + z' [5M]

c) Simplify the following function and realize using universal gates

F (A,B,C) = A'BC' + ABC + B'C' + A'B' [4M]

OR

4 a) Simplify the following Boolean function for minimal SOP form using K-map and implement using NAND gates.

$F(W,X,Y,Z)=\sum(1,3,7,11,15)+d(0,2,5)$ [7M]

b) Find the dual of complement of ABC+D'E+BC'E [2M]

c) Prove the identity of the following equations.

i) X'Y'+X'Y+XY=X+Y ii) A'B+B'C+AB+B'C=1 [4M]

SECTION-III

5 a) Design a combinational logic circuit with 4 inputs A,B,C,D. The output is HIGH if and only if A and C inputs go HIGH. Draw the truth table. Minimize the Boolean function using K-Map. Draw the circuit diagram. [5M]

b) Design a combinational circuit whose input is a 3 input binary number and whose output is a 2's complement of the input number. [4M]

c) Design full adder using only NAND gates. [5M]

OR

6 a) Write short notes on multiplexer. [5M]

b) Design a 64 x 1 MUX using only 8:1 MUXs. [5M]

c) Define magnitude comparator. Explain one-bit the basic comparator. [4M]

SECTION-IV

7 a) Write differences between combinational and sequential circuits. [5M]

b) What is race around condition? How it can be avoided? [5M]

c) Draw schematic circuit of master-slave JK flip-flop and explain its operation [4M]

with the help of truth table.

OR

8 a) Draw the logic diagram and write functional table of a JK-Flip flop using NAND gates. Explain the operation. [8M]

b) Compare latch and flip-flop. [6M]

SECTION-V

9 a) Explain about state equivalence and state reduction. [6M]

b) A sequential circuit has two JK flip-flops A and B, two inputs x and y, and one output z

.The flip-flop input equations and circuit output equation are

JA=Bx+B'y' KA=B' xy'

JB=Ax'y' KB=A+xy'

Z=Ax'y'+Bxy'

i) Draw the logic diagram of the circuit.

ii) Derive the state equations for A and B

iii) Tabulate the state table

iv) Draw the state diagram. [8M]

OR

10 a) Compare synchronous and asynchronous counter. [7M]

b) Design Mod-10 ripple counter using T flip-flop. [7M]

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper II

SWITCHING THEORY & LOGIC DESIGN

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 are Self-complementing codes? Give examples. [4M]

b) Find the 1's complement and 2's complement for the following
i)100011001 ii)110011100 [4M]

c) Justify the statement that "Gray code is a class of reflected code". [6M]

OR

2 a) What are universal gates? Why they are so called? Give the truth tables. [5M]

b) Write the properties of XOR gates. [5M]

c) Generate hamming code for the binary data 1101. [4M]

SECTION-II

3 a) Determine the canonical product-of-sums and sum-of-products form of
T = x'(y' + z') [4M]

b) Define the terms prime implicant and essential prime implicant. [4M]

c) Determine the minimal sum of product form of using K-Map
F(W,X,Y,Z)=∑m(4,5,7,12,14,15)+d(2,8,10) [6M]

OR

4. Use tabular method and simplify the following functions
i)F=∑m(2,3,5,6,7,9,12,14,15) ii) F=∑m(0,1,6,7,8,9,13,14,15) [14M]

SECTION-III

5 a) Design BCD adder and explain operation. [5M]

b) Design a 2-bit comparator to compare two 2-bit numbers. [5M]

c) Write short notes on encoder. [4M]

OR

6 a) Design BCD to Gray code converter. [7M]

b) Design 3 to 8 line decoder and explain operation. [7M]

SECTION-IV

7 a) Draw graphical symbols and write characteristic tables, characteristic equations and excitation tables for the following flip-flops.
i)SR flip-flop ii) JK flip-flop iii) T flip-flop [9M]

b) Explain SR-Latch using NAND gates. [5M]

OR

8 a) What is meant by excitation table. [5M]

b) Covert the following
i) JK flip-flop to T flip-flop ii) SR flip-flop to D flip-flop [9M]

SECTION-V

9 a) Write the differences between synchronous asynchronous sequential circuits.

b) Analyze the following synchronous sequential circuit.

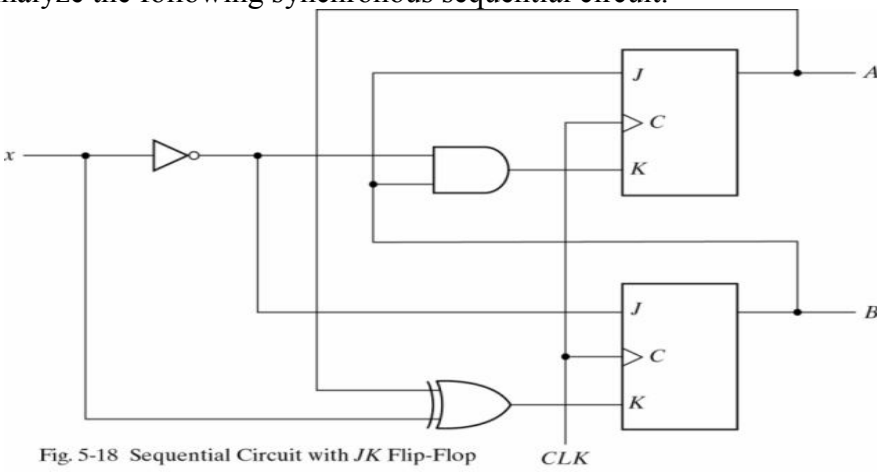

Fig. 5-18 Sequential Circuit with *JK* Flip-Flop

[7M]

OR

10 a) Design Decade synchronous counter using JK-flip flop. [7M]

b). Design bi-direction shift register and explain its operation. [7M]

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MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper III

SWITCHING THEORY & LOGIC DESIGN

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) Write Gray codes for the following decimal numbers. i) 1000
ii) 724 [6M]

b) Use 2's complement arithmetic to subtract
i) $(54)_{10}$ from $(231)_{10}$ ii) $(-27)_{10}$ - $(87)_{10}$ [8M]

OR

2 a) Realize XOR gate using Universal gates. [5M]

b) Briefly explain about parity. [4M]

c) Explain hamming code steps with an example. [5M]

SECTION-II

3 a) What do you mean by Minterm and Maxterm. [5M]

b) State and Demorgan's theorem of Boolean algebra. [4M]

c) Determine the minimal sum of product form of using K-Map
$F(W,X,Y,Z)=\sum m(4,5,7,11,12,15)+d(2,8,9)$ [5M]

OR

4. Use tabular method and simplify the following functions
i)$F=\sum m(2,3,5,6,7,9,12,14,15,17,19,22,23)$ [14M]

SECTION-III

5. a) Design Full adder using half adders. [7M]

b) Design parallel adder/subtractor circuit and explain operation. [7M]

OR

6 a) Design Gray to BCD code converter. [6M]

b) Design 4 to16 line decoder using 3 to 8 line decoders. [4M]

c) Implement full adder using Multiplexer. [4M]

SECTION-IV

7 a) Draw and explain SR- flip flop operation using NAND gates. [7M]

b) Draw and explain Master-Slave flip flop using JK-ff [7M]

OR

8 a) What is excitation table? Write the excitation tables for the following flip-flops.

i) SR flip-flop ii)JK flip-flop [7M]

b) Covert the following

i) SR flip-flop to JK flip-flop ii) JK flip-flop to D flip-flop [7M]

SECTION-V

9 a) Explain the following related to sequential circuits with suitable.
i)State diagram ii) State Table iii) State Assignment [4M]

b) Design a clocked sequential circuit machine using D flip-flop for the state diagram. Use state reductions if possible make proper assignment.

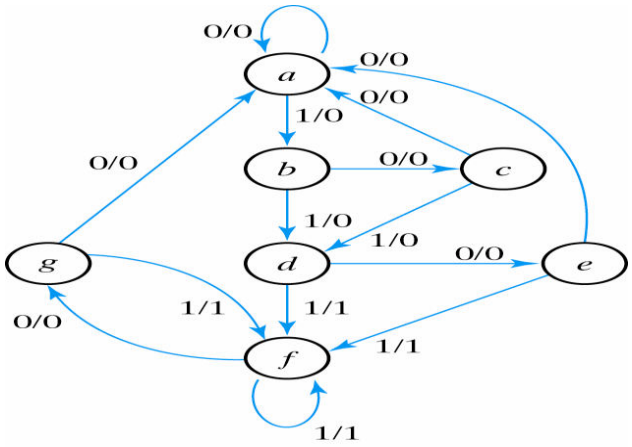


Fig. 5-22 State Diagram

[10M]

OR

10 a) Design Mod-6 Gray code synchronous counter using T-flip flop. [7M]

b). Design Universal shift register and explain its operation. [7M]

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II year – I Semester Examinations, Model Paper-1

PROBABILITY THEORY AND STOCHASTIC PROCESSES

Time: 3 hours **Max. Marks: 70**

Answer one question from each section.

SECTION-I

1. a) State and Prove Bayes' theorem. 7M
   b) Explain the Mathematical model of experiment. 7M

(OR)

2. a) An experiment consists of observing the sum of the outcomes when two fair dice are thrown. Find the probability that the sum is 7 and find the probability that the sum is greater than 10. 7M

   b) In a factory there are 4 machines produce 10%,20%,30%,40% of an item respectively. The defective items produced by each machine are 5%,4%,3% and 2% respectively. Now an item is selected which is to be defective, what is the probability it being from the 2nd machine. And write the statement of total probability theorem? 7M

SECTION-II

3. a) The exponential density function given by
   $fx(x) = (1/b)e^{-(x-a)/b}$ $x > a$
   $= 0$ $x < a$ Find the mean and variance. 7M
   b) Define Moment Generating Function and state and pove any 3 properties. 7M

OR

4. a) Explain the Binomial distribution & density function and also find its mean & variance. 10M
   b) Differentiate monotonic and non-monotonic transfomation of Random vaiable. 4M

SECTION-III

5. a) State and prove the density function of sum of two random variables. 7M
   b) The joint density function of two random variables X and Y is 7M

$$f_{XY}(x,y) = \begin{cases} \frac{(x+y)^2}{40} & ; -1 < x < 1 \text{ and } -3 < y < 3 \\ 0; \text{ otherwise} \end{cases}$$

   Find the variances of X and Y.

OR

6. a) Let Z=X+Y-C, where X and Y are independent random variables with variance σ^2_X, σ^2_Y and C is constant. Find the variance of Z in terms of σ^2_X, σ^2_Y and C. 7M
   b) State and prove the properties of joint characteristic function. 7M

SECTION-IV

7. a) Define Stationary Process and explain various levels of Stationary Processes. 7M
   b) A random process is given as X(t) = At, where A is a uniformly distributed random variable on (0,2). Find whether X(t) is wide sense stationary or not. 7M

OR

8. a) X(t) is a stationary random process with a mean of 3 and an auto correlation function of 6+5 exp (-0.2 $|\tau|$). Find the second central Moment of the random variable Y=Z-W, where 'Z' and 'W' are the samples of the random process at t=4 sec and t=8 sec respectively. 10M

b) Find Autocorrelation function of response of LTI system. 4M

SECTION-V

9. a) Check the following power spectral density functions are valid or not 7M

$i)\ \frac{\cos 8(\omega)}{2+\omega^4}$ $ii)\ e^{-(\omega-1)^2}$

b) Derive the relation between input PSD and output PSD of an LTI system 7M

OR

10. a)Derive the relationship between cross-power spectral density and cross correlation function. 10M

b) State the properties of PSD. 4M

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II year – I Semester Examinations, Model Paper-II

PROBABILITY THEORY AND STOCHASTIC PROCESSES

Time: 3 hours **Max. Marks: 70**

Answer one question from each section.

SECTION-I

1. a) Differentiate joint and conditional probabilities. 4M

   b) In a box there are 100 resistors having resistance and tolerance values given in table. Let a resistor be selected from the box and assume that each resistor has the same likelihood of being chosen. Event A: Draw a 47Ω resistor, Event B: Draw a resistor with 5% tolerance, Event C: Draw a 100Ω resistor. Find the individual, joint and conditional probabilities. 10M

Resistance (Ω)	Tolerance		Total
	5%	10%	
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

OR

2.a)Two boxes are selected randomly. The first box contains 2 white balls and 3 black balls. The second box contains 3 white and 4 black balls. What is the probability of drawing a white ball? 7M

b) An aircraft is used to fire at a target. It will be successful if 2 or more bombs hit the target. If the aircraft fires 3 bombs and the probability of the bomb hitting the target is 0.4, then what is the probability that the target is hit? 7M

SECTION-II

3. a)Derive the Poisson density function and find its mean & variance. 7M

   b) State and prove the properties of probability density function. 7M

OR

4. a)If X is a discrete random variable with a Moment generating function of $M_x(v)$, find the Moment generating function of 10M

   i) Y=aX+b ii)Y=KX iii) $Y=\frac{X+a}{b}$

   b) List the properties of conditional distribution and conditional density function. 4M

SECTION-III

5. a) State and explain the properties of joint density function 7M

   b) The joint density function of random variables X and Y is 7M

$$f_{XY}(x,y) = \begin{cases} 8xy; & 0 \le x < 1, 0 < y < 1 \\ 0, & otherwise \end{cases}$$

Find f(y/x) and f(x/y)

OR

6. a)The input to a binary communication system is a RV X, takes on one of two values 0 and 1, with probabilities ¾ and ¼ respectively. Due to the errors caused by the channel noise, the output random variable Y, differs from the Input X occasionally. The behavior of them communication system is modeled by the conditional probabilities
$P\left(\frac{Y=1}{X=1}\right) = \frac{3}{4}$ and $P\left(\frac{Y=0}{X=0}\right) = \frac{7}{8}$ Find
i) The probability for a transmitted message to be received as 0
ii) Probability that the transmitted message is a1. If the received is a 1. 10M
b) Explain covariance of two random variables. 4M

SECTION-IV

7. Explain the following (5+5+4)M
i) Stationary
ii) Ergodicity
iii) Distribution & density functions of random processes

OR

8. a) Given the RP X(t) = A cos(w_0t) + B sin (w_0t) where ω_0 is a constant, and A and B are uncorrelated Zero mean random variables having different density functions but the same variance σ^2. Show that X(t) is wide sense stationary. 7M
b) For a stationary random process X(t) with periodic components the Auto correlation function is $R_{XX}(\tau)=36+4/(1+5\tau^2)$.Find E[X(t)],E[$X^2$(t)] and power in X(t). 7M

SECTION-V

9. A stationery random process X(t) has spectral density $S_{XX}(\omega)=25/(\omega^2+25)$ and an independent stationary process Y(t) has the spectral density $S_{YY}(\omega)= \omega^2/(\omega^2+25)$. If X(t) and Y(t) are of zero mean, find the: (7+7)M
a) PSD of Z(t)=X(t) + Y(t) b) Cross spectral density of X(t) and Z(t)

OR

10. a)Find power spectral density of the random process whose autocorrelation function is $R_{XX}(\tau) = A\cos(\omega\tau)$ 7M
b) The input to an LTI system with impulse response h(t)= $\delta(t) + t^2e^{-at}$. U(t) is a WSS process with mean of 3. Find the mean of the output of the system. 7M

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II year – I Semester Examinations, Model Paper-III

PROBABILITY THEORY AND STOCHASTIC PROCESSES

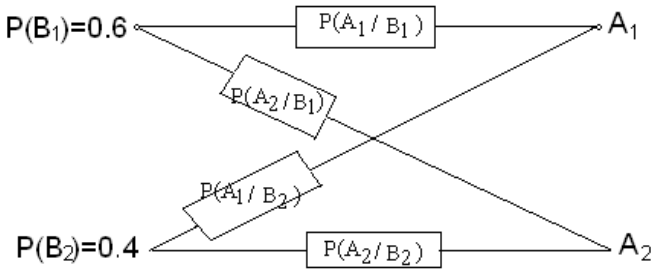
Time: 3 hours **Max. Marks: 70**

Answer one question from each section.

SECTION-I

1. a) Define Pobability Axioms with mathemetical expressions. 4M

   b) Determine probabilities of system error and correct system transmission of symbols for an elementary binary communication system shown in below figure consisting of a transmitter that sends one of two possible symbols (a 1 or a 0) over a channel to a receiver. The channel occasionally causes errors to occur so that a '1' show up at the receiver as a '0? And vice versa. Assume the symbols '1' and '0' are selected for a transmission as 0.6 and 0.4 respectively. 10M



OR

2. a) In a binary communication system, the errors occur with a probability of "p", In a block of "n" bits transmitted, what is the probability of receiving 7M

   i) at the most 1 bit in error

   ii at least 4 bits in error

   b) Define independent events and state the condition for independence of 2 and 3 events. 7M

SECTION-II

3. a) A random variable X has the distribution function 10M

   $F_X(x)= \sum_{n=1}^{12} \frac{n^2}{650} u(x-n)$

   Find the probability of i) P{-∞ < X ≤ 6.5} ii)p{X>4} iii) p{6< X ≤ 9}

   b)) State and prove the properties of probability distribution function 4M

OR

4. a) Let X be a Continuous random variable with density function 7M

   $f(x)= \frac{x}{9} + K \quad 0 \le x \le 6$

   0 otherwise

   Find the value of K and also find P{2 ≤ X ≤ 5}

   b) Determine mean and vaiance of uniform distribution. 7M

SECTION-III

5. a) Let X and Y be the random variables defined as X=Cosθ and Y=Sinθ where θ is a uniform random variable over (0, 2π). Are X and Y Uncorrelated/Are X and Y Independent? 7M

   b) Explain about Marginal Distribution and density Functions 7M

OR

6. a) Define and State the properties of joint cumulative distribution function of two random variables X and Y. 7M

   b) A joint probability density function is $f_{x,y}(x,y) = \frac{1}{24}$ $0 < x < 6, 0 < y < 4$

   0 else where

   Find the expected value of the function $g(X,Y) = (XY)^2$ 7M

SECTION-IV

7. a) A Gaussian RP has an auto correlation function $R_{XX}(\tau) = \frac{6\sin(\pi\tau)}{\pi\tau}$. Determine a covariance matrix for the Random variable X (t) 7M

   b) Derive the expression for cross correlation function between the input and output of a LTI system. 7M

OR

8. a) Derive the Expression for mean and mean square value of response of LTI system. 7M

   b) Discuss in detail about stationary random process and its levels. 7M

SECTION-V

9. a) A random process Y(t) has the power spectral density $S_{YY}(\omega) = \frac{9}{\omega^2+64}$ 7M

   Find i) the average power of the process

   ii) The Auto correlation function

   b) State and pove any3 properties of cross power spectral density 7M

OR

10. a) A random process has the power density spectrum $S_{YY}(\omega) = \frac{6\omega^2}{1+\omega^4}$. Find the average power in the process. 7M

    b) Find the auto correlation function of the random process whose psd is $\frac{16}{\omega^2+4}$ 7M

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper I -2018

NETWORK ANALYSIS AND TRANSMISSION LINES

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 **5*14=70M**

1 a) Explain DC response of series RL Circuit. **(7M)**

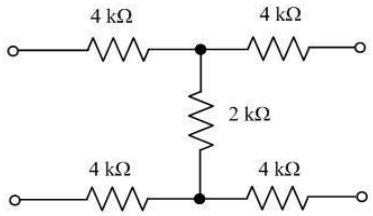
b) A series RLC circuit with R=6ohm, L=2H and C=0.25F is excited by a dc voltage of 2V. Obtain expression for I(t) **(7M)**

(OR)

2. Explain Transient response of a series R-L-C circuit and draw a current, voltage and power response ? (14M)

SECTION-II

3 a) Determine Z parameters for network shown below (7M)



b) Explain h- parameters of two port network and obtain relationship with z parameters. (7M)

(OR)

4 a) Express Z parameters in terms of Y parameters and vice versa (7M)

b) Determine the H parameters with the following data. (7M)

i) With the output terminals short circuited V1=25V,I1=1A,I2=2A

ii) With the input terminals open circuited V1=10V,V2=50V,I2=2A

SECTION-III

5 a) prove that locus of the current phasor for a series circuit consisting fixed capacitance in series with a variable resistance R is a semicircle if the circuit is connected to a sinusoidal ac supply. (7M)

b) Explain circle equations for RL circuit with fixed resistance and variable reactance (7M)

(OR)

6. What is resonance? Explain relationship between bandwidth and quality factor in case of series. R- L-C circuit. (14M)

SECTION-IV

7 a) The propagation constant of a lossy transmission line is $1+j2\ m^{-1}$ and its characteristic impedance is $20+j0\Omega$ at ω= 1rad/s. Find R,C,L,G for the Line (9M)

b) Write down the Applications of Smith chart (5M)

OR

8 a) Derive the relation between reflection coefficient and characteristic impedance (7M)

b) Write short notes on smith chart (7M)

SECTION-V

9 a) Derive the Condition for Distrotionless Transmission Line (7M)

b) Measurements on a Transmission Line of length 120Km were made at frequency of 6000Hz.If ZOC=520(-30deg) and ZSC=640(43deg) find Zo and P (7M)

OR

10 a) Derive the Basic Transmission Line Equation (7M)

b) A lossless transmission line length 'l' with Z0=50 is terminated by a load of ZL=50+j50.Determine the reflection coefficient "Rr" and the standing wave Ratio (7M)

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper II -2018

NETWORK ANALYSIS AND TRANSMISSION LINES

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

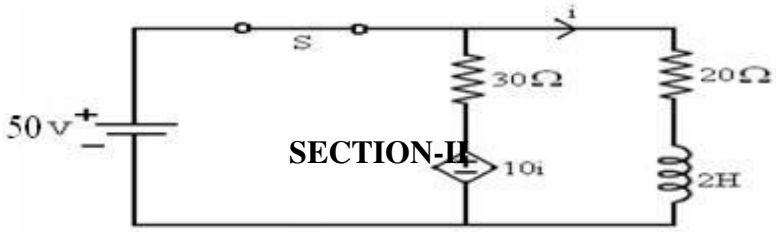
SECTION-I

1 a) Explain DC response of series RC Circuit. (7M)

b) A series RLC circuit with R=10ohm, L=4H and C=0.5F is excited by a dc voltage of 12V. Obtain expression for I(t). (7M)

(OR)

2. For the below circuit (Fig. 1), find the current equation i(t), when the switch is opened at t = 0 (7M)

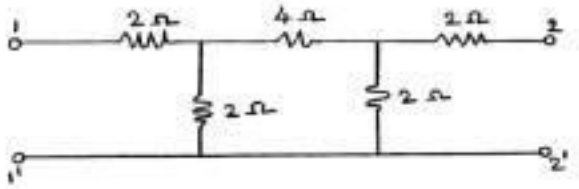


SECTION-II

3. Define Image impedances Zi1 and Zi2 of a two port network. From this definition derived expressions for the image impedances in terms of ABCD parameters (14M)

(OR)

4 a) Find Transmission parameters for the following network (7M)



b) Represent h- parameters in terms of Y-parameters for a two port network (7M)

SECTION-III

5. Explain about parallel Resonance in detail along with quality factor and band width ? (14M)

(OR)

6. Draw the locus diagram of series R-L circuit and R-C circuit when R is variable (14M)

SECTION-IV

7 a) Derive the relation between E and H for uniform plane wave. (7M)

b) A 100MHz uniform plane wave Propagates in a lossless medium for which $\epsilon_r=5$ and $\mu_r=1$ find vp, β, λ, Es, Hs. (7M)

OR

8 a) Derive The Expression for Transmission Line Equation (7M)

b) Given R = 10.4 Ω/mt (7M)

L = 0.00367 H/mt

G = 0.8×10^{-4} mhos/mt

C = 0.00835 μF/mt. Calculate Z0 and γ at 1.0 KHz.

SECTION-V

9 a) Explain the construction of smith Chart (7M)

b) A lossless transmission line of length 'l' with Z0=50 is terminated by a load of ZL=50+j50. Determine the reflection coefficient and the standing wave Ratio (7M)

OR

10 a) Establish the relations for Zsc and Zoc of rf lines and sketch their variation with βl (7M)

b) Derive the expression for α and β in terms of primary constants of a line (7M)

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year I Semester Examinations, Model Paper III -2018

NETWORK ANALYSIS AND TRANSMISSION LINES

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.

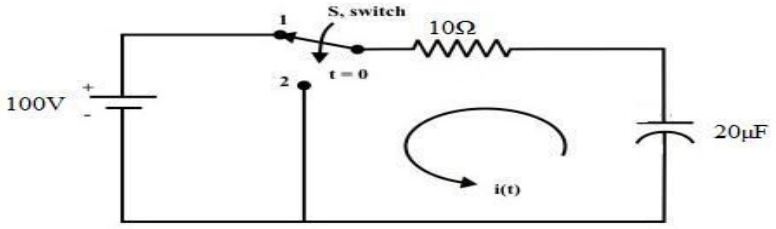
5*14=70M

SECTION-I

1. Explain DC response of RLC series circuit and also draw voltage, current & power waveforms (14M)

(OR)

2. In the given circuit the switch is shifted from position-1 to position -2 at t=0.Determine i(t) for t>0 (14M)



SECTION-II

3. Explain about the interconnection of two port networks in series parallel and cascaded configurations **(14M)**

(OR)

4 a) Represent Z- parameters in terms of ABCD-parameters for a two port network (7M)

b) Explain about image parameters? (7M)

SECTION-III

5 a) Explain about series Resonance in detail along with quality factor and band width (7M)

b) Draw the admittance locus diagrams of series R-C circuit and R-L circuit when R is variable (7M)

(OR)

6 a) Explain about dot convention (7M)

b) Explain Faraday's laws of electromagnetic induction (7M)

SECTION-IV

7 a) Define Transmission line? Explain different types of Transmission lines (7M)

b) Derive the expression for the input impedance of a transmission line of length L. (7M)

OR

8 a) List out the applications of transmission lines (4M)

b) Explain the principal of single stub matching (10M)

SECTION-V

9 a) Derive the characteristic impedance of a transmission line in terms of its line constants (7M)

b) Derive an expression for the propagation constant and characteristic impedance of Transmission line with R,L,C,G (7M)

OR

10. Describe the construction of smith chart and give its applications (14M)

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper I -2018
CONTROL SYSTEMS

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 **5*14=70M**

1. a) Explain open loop & closed loop control systems by giving suitable Examples & also highlights their merits & demerits. [7M]
   b) Explain the classification of control systems? [7M]

(OR)

2. a) Explain mathematical model of a physical system? Explain briefly [7M]
   b) How do you construct a signal flow graph from the equations? List advantages of signal flow graph over block diagram? [7M]

SECTION-II

3 a) Derive the transient response of under damped second order system when excited by unit step input? [7M]
   b) Explain error constants Kp K_v and K_a for type I system. [7M]

(OR)

4. a) A unity feed-back system is characterized by the open-loop transfer function: G(s)= 1/ s(0.5s +1)(0.2s +1). Determine the steady-state errors for unity-step, unit-ramp and unit-acceleration input. Also find the damping ration and natural frequency of the dominant roots. [7M]
   b) A feedback control system is described as G(s) = 50/s(s+2)(s+5) , H(s) = 1/s For a unit step input, determine the steady state error constants & errors [7M]

SECTION-III

5 a) Define the terms i) Absolute stability (ii) marginal stability (iii) conditional stability (iv) stable system (v) Critically stable system (vi) conditionally stable system? [7M]
   b) By means of Routh criterion, determine the stability represented by characteristic equation ,$s^4+2s^3+8s^2+4s+3=0$ [7M]

(OR)

6 a) Check the stability of the given characteristic equation using Routh's method $S^6+s^5-2s^4-3s^3-7s^2-4s-4=0$ [7M]
   b) Sketch the root locus G(S)=K/s(s^2+6s+10), H(S)=1 [7M]

SECTION-IV

7. write short notes on various frequency domain specifications. [14M]

(OR)

8. Derive expression for resonant peak and resonant frequency and hence establish correlation between time and frequency response. [14M]

SECTION-V

9. a) Explain the state variable and state transition matrix? [7M]
   Write short notes on canonical form of representation. List its advantages and disadvantages?
   b) A linear time invariant system is characterized by homogenous state equation.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}.$$

Compute the solution of homogenous equation, assuming the initial state vector [7M]

(OR)

10. Obtain the state model of armature controlled dc motor? [14M]

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper II -2018
CONTROL SYSTEMS

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 is a mathematical model of a physical system? Explain briefly. [7M]

b) Obtain the transfer function for the following network Figure 1b [7M]

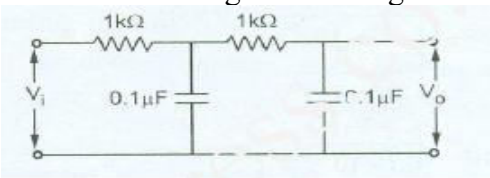


Figure 1b

(OR)

2. Determine transfer function for the following mechanical rotational system [14M]

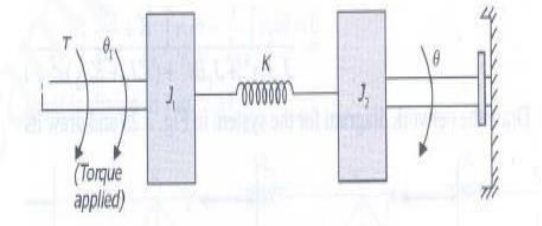


Figure 1b

SECTION-II

3 a) Define the following systems and sketch their output wave forms for an unit step i/p [7M]

i. Under damped system ii. Undamped system

iii. Over damped system iv. Critically damped system

b) For a second order system ξ =0.6,ω_n=5 rad/sec Find the values of ω_d, Tr,Tp,Ts and M_P .[7M]

(OR)

4. a) Explain error constants Kp, Kv, Ka for type-1 system? [7M]

b) A unity feed back system has an open loop transfer function G(s) = 25/s(s+8). Determine its damping ratio, peak overshoot and time required to reach the peak output. Now a derivative component having T.F. of s/10 is introduced in the system. Discuss its effect on the values obtained above? [7M]

SECTION-III

5) Sketch the root locus plot for the systems whose open loop transfer function is given by

$G(s)H(s)=K/(s(s+1)(s+3)$ [14M]

(OR)

6. a) What is root locus plot? Explain with suitable example? [7M]
   b) What are the features of root locus plot? [7M]

SECTION-IV

7.a) Explain the effect of addition of a pole at the origin on the polar plot of a given system.[7M]
   (b) Sketch the polar plot & hence find the frequency at which the plot intersects the +ve imaginary axis for the system $G(s) =0.1/(s^2(1+s)(1+0.1s))$ Also find the corresponding magnitude. [7M]

(OR)

8) a) What is "Nyquist Contour"? [7M]
   b) A system is given by $G(s) = 4s+1/(s^2(s+1)(2s+1))$ Sketch the Nyquist plot & hence determine the stability of the system. [7M]

SECTION-V

9) Obtain the state model of armature-controlled dc motor? [14M]

(OR)

10)The system is represented by the differential equation

$$\ddot{y} + 5\dot{y} + 6y = u$$

Find the transfer function from state variable representation. [14M]

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
B.Tech II Year II Semester Examinations, Model Paper III -2018
CONTROL SYSTEMS

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)By means of relevant diagrams explain the working principles of a practical closed loop system. [7M]
   b) Describe the analogy between electrical and mechanical systems [7M]

(OR)

2. Find the transfer function X(s)/F(s) of the system Figure 1 given below. [14M]

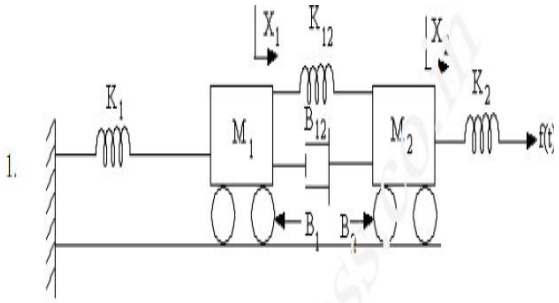


Figure 1

SECTION-II

3. The overall T.F. is a unity feed back control system is given by $c(s)/R(s)=10/(s^2+6s+10)$
   (a) Find Kp, Kv, Ka
   (b) Determine the steady - state error if the input is r(t)=1 + t + t2. [14M]

(OR)

4. (a) Explain about various test signals used in control system? [7M]
   (b) Measurement conducted on a servomechanism shows the system response to be $C(t) = 1 + 0.2e^{-60t} - 1.2e^{-10t}$, when subjected to a unit step input. Obtain the expression For closed loop T.F., the damping ratio and undamed natural frequency of oscillations? [7M]

SECTION-III

5. a) The open loop t.f. of a unity feed-back system is given by $G(s)= K/(s(1+0.25s)(1+0.4s))$ Find the restriction on K so that the closed loop system is absolutely stable? [7M]
   b) A feed-back system has an an open loop t.f of $G(S)H(S)= Ke^{-s}/(s(s^2+5s+9))$ Determine by the use of the RH criterion ,the max. value of K for the closed loop system to be stable? [7M]

(OR)

6. (a) Explain the RH stability Criterion ? [7M]

(b) The open loop transfer function of a unity feed back control system is given by $G(s)= K/((1+ST_1)(1+ST_2)$ Apply RH stability criterion, determine the value of K in terms of T1 and T2 for the system to be stable? [7M]

SECTION-IV

7 a) Explain the effect of addition of a pole at the origin on the polar plot of a given system.[7M]

b) Sketch the polar plot & hence find the frequency at which the plot intersects the +ve imaginary axis for the system $G(s) =0.1/(s^2(1+s)(1+0.1s))$ Also find the corresponding magnitude. [7M]

(OR)

8. a) What is "Nyquist Contour"? [7M]

(b) A system is given by $G(s) = 4s+1/(s^2(s+1)(2s+1))$ Sketch the Nyquist plot & hence determine the stability of the system. [7M]

SECTION-V

9. a) Discuss the significance of state Space Analysis? [7M]

b) Define state variables. [7M]

(OR)

10) Obtain the state variable representation of an armature controlled D.C Servomotor [14M]

R18

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_β and f_T. 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.

OR

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

R18

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**

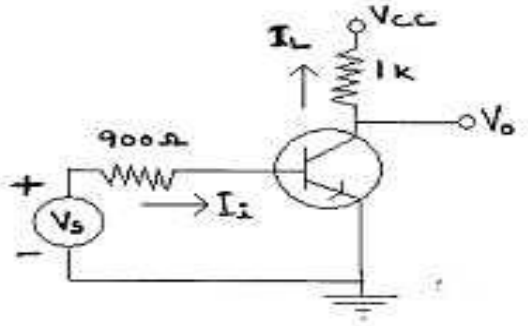
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

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

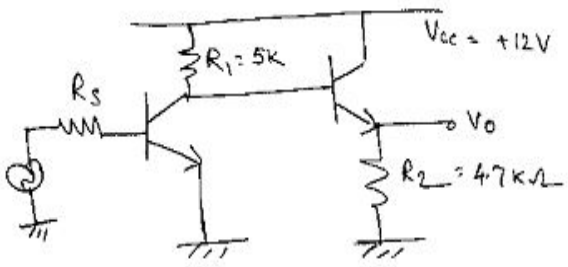
   i. The upper 3 dB frequency of the current gain AI

   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, R_i, R_o are decreased by a factor (1+Aβ) with feedback.

OR

4. (a) Derive the expression for frequency of Oscillation for a Colpitts Oscillator.

(b) In a A Hartley Oscillator L_2=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.

OR

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

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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

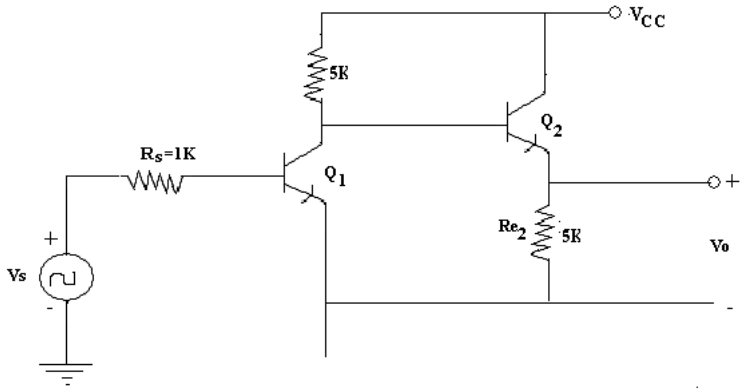
hre = 10−4.

At the same operating point, fT = 50MHz and Cc=3PF, compute the values of all the Hybrid - π parameters

OR

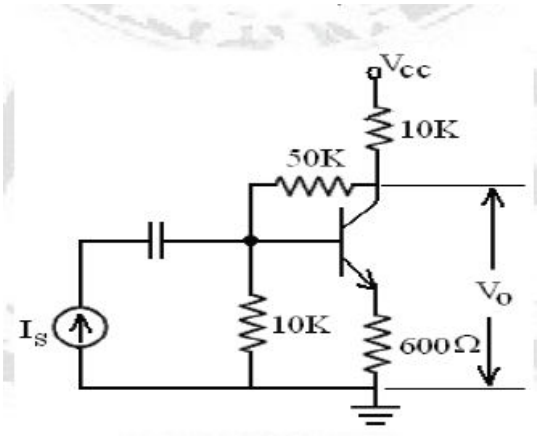
2. (a) Discuss about different types of distortions that occur in amplifier circuits

(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 h_{ie}= 1k, h_{re} and h_{oe} negligible. Find $R_{mf}=V_o/I_s$ $A_{vf}=Vo/V_s$ R_{if} and R_{of}.



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 h_{fe} 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.

OR

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

OR

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.

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year II Semester Examinations, Model Paper I -2018

ELECTROMAGNETIC FIELDS & WAVES

1) a) State and prove the coulomb's law?

b) Five identical 15μC point charge are located at the centre and corners of a square defined by -1<x, y<1,z=0.i) Find the force on the 10μC point charge at(0,0,2).ii) Calculate the electric field intensity at(0,0,2).

OR

2) a) State and prove The Continuity Equation

b) The current density in a cylindrical conductor of radius a placed along the z-axis is $J=10e^{-(1-\rho/a)}azA/m^2$ Find the current through the cross section of the conductor.

3) a) State and prove The Differential form of Ampere's Circuit Law

b) An infinitely long solid conductor of radius r is placed along the z-axis. If the conductor carries current I in the z direction, show that $H=Ir/2\pi r^2a_r$

OR

4) a) State and Prove Boundary condition between Dielectric-Dielectric

b) A conducting circular loop of radius 20cm lies in the z=0 plane in a magnetic field $B=10\cos 377tazmWb/m^2$. Calculate the induced voltage in the loop.

5) a)Derive The attenuation and phase constant in conducting medium

b) At 50MHz, a lossy dielectric material is characterized by $\varepsilon=3.6\varepsilon_0$, $\mu=2.1\mu_0$ and $\sigma=0.08S/m$. If $Es=6e^{-\Upsilon x}azV/m$, compute i) Υ ii) λ iii) u iv)η v) H_S

OR

6) Find all the relations between E and H in a uniform plane wave. Find the value of intrinsic impedance of free space.

7) a) Derive Expression for reflection and transmission coefficients of an EM wave when it is incident normally on a dielectric

b) A perpendicularly polarized wave is incident at an angle of $\theta_i=15$degrees. It is propagating from medium1 to medium2 .medium 1 is defined by $\varepsilon_{r1}=8.5,\mu_{r1}=1,\sigma_1=0$ and medium 2 is free space if $E_i=1mv/m$, determine E_r, H_i, H_r

OR

8) State and Prove Ponyting theorem

9) What are the advantages and applications of microwave frequencies? Discuss in detail.

OR

10) Derive the expressions for cut off frequency, phase constant, group velocity, phase velocity and wave impedance in rectangular waveguide, for TE modes.

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year II Semester Examinations, Model Paper II -2018

ELECTROMAGNETIC FIELDS & WAVES

1) a) State and prove Gauss's Law in both integral and Differential forms.

b) In free space $D=2y^2a_x+4xya_y-a_z mC/m^2$. Find the total charge stored in the region $1<x<2$, $1<y<2$, $-1<z<4$

OR

2) a) State and Prove Laplace's and Poisson's Equation Starting from Gauss's Law

b) The potential field $V=2x^2yz-y^3z$ exists in a dielectric medium having $\varepsilon=2\varepsilon_0$ calculate the total charge within the unit cube $0<x<1m, 0<y<1, 0<z<1m$.

3) a) Derive The force between the two parallel conductor of current carrying element.

b) An electron with velocity $v=(3ax+12ay-4az)x10^5 m/s$ experiences no net force at a point in a magnetic field $B=10ax+20ay+30azmWb/m^2$.Find E at that point.

OR

4) a) Obtain the integral form of Maxwell's equation from Amperes circuit law in the generalized form.

b) In a medium of $\mu_r=2$, find E, B and displacement current density if $H=25\sin(2x10^8t+6x)aymA/m$

5) a)Derive The attenuation and phase constant in conducting medium

b) At 50MHz, a lossy dielectric material is characterized by $\varepsilon=3.6\varepsilon_0$, $\mu=2.1\mu_0$ and $\sigma=0.08S/m$. If $Es=6e^{-\Upsilon x}azV/m$, compute i) Υ ii) λ iii) u iv)η v) H_S

OR

6) Find all the relations between E and H in a uniform plane wave. Find the value of intrinsic impedance of free space.

7) a) Derive Expression for reflection and transmission coefficients of an EM wave when it is incident normally on a dielectric

b) A perpendicularly polarized wave is incident at an angle of $\theta_i=15$degrees. It is propagating from medium1 to medium2 .medium 1 is defined by $\varepsilon_{r1}=8.5, \mu_{r1}=1, \sigma_1=0$ and medium 2 is free space if $E_i=1mv/m$, determine E_r, H_i, H_r

OR

8) a) Obtain an expression for the power loss in a plane conductor in terms of the surface resistance R_S

b) A plane wave travelling in a medium of $\varepsilon_r=1, \mu_r=1$ has an electric field intensity of $100x\sqrt{\pi}v/m$.Determine the energy density in the magnetic field and also the total energy density.

9) Derive the wave equations for TM mode in Rectangular Wave guide

OR

10) a) What are Power Transmission and Power losses in Rectangular wave guide.

b) Derive the Quality Factor of a rectangular cavity resonator.

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year II Semester Examinations, Model Paper III -2018

ELECTROMAGNETIC FIELDS & WAVES

1) a)Derive the line charge, surface charge Electric field Intensity

b) If J=100/ρ2aρA/m2,find the time rate of increase in the volume charge density, the total current passing through surface defined by $\rho=2, 0<z<1, 0<\phi<2\pi$.

OR

2) a) State and Prove Laplace's and Poisson's Equation Starting from Gauss's Law

b) The potential field $V=2x^2yz-y^3z$ exists in a dielectric medium having $\varepsilon=2\varepsilon_0$ calculate the total

charge within the unit cube $0<x<1m, 0<y<1, 0<z<1m$.

3) a) State and prove The Biot-Savart Law

b) Find the flux crossing the plane surface defined by $0.5\leq r\leq 2m$ and $0\leq z\leq 3m$ if $B=(4/ra\phi)T$.

OR

4) a) State and Prove Boundary condition between Dielectric-Dielectric

b) A Potential field is given by $V=15(x^2-y^2)$.The point p(4,-2,1) lies on the boundary of the conductor and free space At P, obtain the magnitudes of i) V ii) E iii)E_N iv) E_{tan} v)D v i)ρ_s

5) a)Derive The attenuation and phase constant in conducting medium

b) At 50MHz, a lossy dielectric material is characterized by $\varepsilon=3.6\varepsilon_0$, $\mu=2.1\mu_0$ and $\sigma=0.08S/m$. If $Es=6e^{-\Upsilon x}azV/m$, compute i) Υ ii) λ iii) u iv)η v) H_S

OR

6) Find all the relations between E and H in a uniform plane wave. Find the value of intrinsic impedance of free space.

7) a) Derive Expression for reflection and transmission coefficients of an EM wave when it is incident normally on a dielectric

b) A perpendicularly polarized wave is incident at an angle of $\theta_i=15$degrees. It is propagating from medium1 to medium2 .medium 1 is defined by $\varepsilon_{r1}=8.5, \mu_{r1}=1, \sigma_1=0$ and medium 2 is free space if $E_i=1mv/m$, determine E_r, H_i, H_r

OR

8) a) Obtain an expression for the power loss in a plane conductor in terms of the surface resistance R_S

b) A plane wave travelling in a medium of $\varepsilon_r=1, \mu_r=1$ has an electric field intensity of $100x\sqrt{\pi}v/m$.Determine the energy density in the magnetic field and also the total energy density.

9) Derive the expressions for cut off frequency, phase constant, group velocity, phase velocity and wave impedance in rectangular waveguide, for TE modes.

OR

10) a) What are Power Transmission and Power losses in Rectangular wave guide.

b) Derive the Quality Factor of a rectangular cavity resonator.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester

Analog Communications (ECE)

Model Paper-1

Time: 3 hours **Max. Marks: 70**

Note: Answer one question from each section.

SECTION – I

1. a) Explain how an amplitude modulated signal can be detected using a square law detector.[7M]
   b) An AM transmitter radiates 50W power when carrier is modulated and μ=0.707. Determine i) carrier power ii) modulation efficiency [7M]

(OR)

2. a) Explain how a DSBSC signal is represented in the time and frequency domain[7M]
   b) Explain how a DSBSC signal is generated using a balanced modulator.[7M]

SECTION – II

3. a) Explain how a SSBSC signal is generated using a filter method.[7M]
   b) Compare different amplitude modulation techniques. [7M]

(OR)

4. a) Explain the generation of VSBSC signal [7M]
   b) What are the applications of different amplitude modulation systems? [7M]

SECTION – III

5. a) Derive the expression for single tone frequency modulated signal.[7M]]
   b) A 100 M Hz carrier is frequency modulated by a sinusoidal signal of amplitude 20V and frequency 100K Hz .The frequency sensitivity of the modulator is 25K Hz/volt. Determine i) frequency deviation ii) modulation index (β) iii) bandwidth [7M]

(OR)

6. a) Explain about pre emphasis and de emphasis in FM systems [7M]
   b) Differentiate Narrowband and Wideband FM [7M]

SECTION – IV

7. a)Define i) Noise bandwidth Ii) Noise figure [7M]
   b) Derive the expression of figure of merit for Amplitude modulated system.[7M]

(OR)

8. Derive the expression of figure of merit for DSBSC system.[14M]

SECTION – V

9. a) Explain the characteristics of a radio receiver. [7M]
   b) Explain the operation of Tuned radio frequency (TRF) receiver with the block diagram and mention its advantages and disadvantages. [7M]

(OR)

10. Explain the generation and demodulation of single polarity PAM signals.[14M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester

Analog Communications (ECE)

Model Paper-2

Time: 3 hours **Max. Marks: 70**

Note: Answer one question from each section.

SECTION – I

1. a) What is the principle of amplitude modulation? Derive the expression for the AM wave and draw its spectrum.[7M]

   b) Consider an AM signal $s(t)=20(1+0.9\cos 2\pi 10^4 t)\cos 2\pi 10^6 t$.The signal is radiated into free space using an antenna having resistance of 5Ω. Calculate i) Power ii)Bandwidth iii) modulation efficiency [7M]

(OR)

2. a) What is the effect of frequency and phase error in demodulation of DSB-SC wave using synchronous detector.[7M]

   b) Explain how a DSBSC signal is detected using a COSTAS Loop[.[7M]

SECTION – II

3. a) Explain the time domain representation of an SSBSC signal.[7M]

   b) Explain how a SSBSC signal is generated using phase discrimination method. [7M]

(OR)

4. a) Explain the detection of VSBSC signal [7M]

   b) What are the applications of different amplitude modulation systems and also compare them. [7M]

SECTION – III

5. a) Derive the expression for Narrow band frequency modulated signal.[7M]]

   b) Consider an FM signal $s(t)=10\cos(2\pi\ 10^6 t+8\sin 4\pi\ 10^3 t)$.Determine i)Modulation index ii) frequency deviation iii) power iv) bandwidth [7M]

(OR)

6. a) Explain how a frequency modulated signal is generated using varactor diode [7M]

   b) Explain how a FM signal is demodulated using PLL(Phase locked loop) [7M]

SECTION – IV

7. a)Define i) Noise temperature ii) Noise figure [7M]

   b) Derive the expression of figure of merit for Frequency modulated system. [7M]

(OR)

8. a) Derive the expression of figure of merit for SSBSC system.[7M]

   b) Explain about the noise temperature with necessary equations. [7M]

SECTION – V

9. a) Explain the terms [7M]

   (i) AGC

   (ii) Amplitude Limiting.

   b) Explain the operation of super hetero dyne receiver with the block diagram. [7M]

(OR)

10. Explain the generation and demodulation of PPM signals.[14M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester

Analog Communications (ECE)

Model Paper-3

Time: 3 hours **Max. Marks: 70**

Note: Answer one question from each section.

SECTION-I

1. Show, giving a mathematical proof, how a square-law device can be used to generate an AM signal. Give complete diagram of the signal input and output arrangements. Draw the output spectrum.[7M]

(OR)

2. Explain Frequency Division Multiplexing with a neat diagram. [14M]

SECTION-II

3. i) Find the percentage of power saved in SSB when compared with AM system.[7M]
   ii) Why VSB system is widely used for TV broadcasting - Explain?[4M]
   iii) Why SSB transmission is preferred to DSB-SC?[3M]

(OR)

4. (a) Derive an expression for SSB modulated wave for which upper side band is retained.[7M]
   (b) Explain the demodulation of an AM-SSB-SC signal. [7M]

SECTION-III

5. Explain the principle of Angle Modulation. Derive and explain phase deviation, Modulation index, frequency deviation and percentage modulation.[14M]

(OR)

6. (a)Explain the generation of FM wave using reactance modulator. [7M]
   (b) Compare AM & FM. [7M]

SECTION-IV

7. Derive the canonical representation of the narrow band noise. Prove that both the in phase noise $n_c(t)$ and quadrature noise $n_s(t)$ have the same power spectral density.[14M]

(OR)

8. Derive an expression of figure of merit for SSBSC system and compare it with AM & DSB-SC.[14M]

SECTION-V

9. (a) Explain the generation and demodulation of PWM signal.[7M]
   (b) Compare different Pulse Modulation techniques. [7M]

(OR)

10. (a) Draw and explain the block diagram of an FM receiver.[7M]
    (b) A super Hetero dyne receiver is tuned to receive a 1000KHz carrier amplitude modulated by 1KHz sine wave. Assuming the IF of the receiver to be 455KHz, and the frequency components at the input and output of the IF amplifier. Assume the IF bandwidth to be 10 KHz. [7M]

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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 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)

R18

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

B.Tech II Year II Semester Examinations, Model Paper I -2018

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

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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 unit Rs. 100 • Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (7M)

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	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)

R18

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.
(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)