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

INFORMATION TECHNOLOGY

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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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 INFORMATION TECHNOLOGY

COURSE STRUCTURE

I Year B. Tech (IT) – 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**	**01**	**14**	**20**	**240**	**560**

I Year B. Tech (IT) – 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**	**01**	**10**	**20**	**340**	**560**

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

II Year B.Tech (IT) - I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1201	Computer Organization And Architecture	3	0	0	3	30	70
2	R18A0503	Data Structures	3	0	0	3	30	70
3	R18A0504	Operating Systems	3	0	0	3	30	70
4	R18A0506	Discrete Mathematics	3	0	0	3	30	70
5	R18A0024	Probability And Statistics	3	0	0	3	30	70
6	R18A0461	Analog And Digital Electronics	3	0	0	3	30	70
7	R18A0583	Operating Systems Lab	0	0	3	1.5	30	70
8	R18A0584	Data Structures Lab	0	0	3	1.5	30	70
9*	R18A0004	Foreign Languages : French	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

II Year B.Tech (IT) - II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A0507	Software Engineering	3	0	0	3	30	70
2	R18A0508	Formal Language And Automata Theory	3	0	0	3	30	70
3	R18A0509	Java Programming	3	0	0	3	30	70
4	R18A0510	Database Management Systems	3	0	0	3	30	70
5	******	Open Elective - 1	3	0	0	3	30	70
6	R18A0061	Managerial Economics And Financial Analysis	3	0	0	3	30	70
7	R18A0585	Java Programming Lab	0	0	3	1.5	30	70
8	R18A0586	Database Management Systems Lab	0	0	3	1.5	30	70
9*	R18A0014	Environmental Sciences	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

III Year B.Tech (IT) - I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A0511	Design And Analysis of Algorithms	3	0	0	3	30	70
2	R18A0514	Computer Networks	3	0	0	3	30	70
3	R18A0518	Web Technologies	3	0	0	3	30	70
4	R18A0462	Embedded Systems	3	0	0	3	30	70
5	R18A1202 R18A0513 R18A0521	Professional Elective 1: 1. Knowledge Management 2. Computer Graphics 3. Distributed Systems	3	0	0	3	30	70
6	******	Open Elective - 2	3	0	0	3	30	70
7	R18A0588	Computer Networks Lab	0	0	3	1.5	30	70
8	R18A0589	Web Technologies Lab	0	0	3	1.5	30	70
9*	R18A0006	Technical Communication And Soft Skills	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

III Year B.Tech (IT) - II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1203	Software Process And Project Management	3	0	0	3	30	70
2	R18A0525	Data Warehousing And Data Mining	3	0	0	3	30	70
3	R18A0526	Linux Internals	3	0	0	3	30	70
4	R18A1204 R18A0519 R18A0528	Professional Elective 2: 1. Computational Intelligence 2. Information Security 3. Mobile Computing	3	0	0	3	30	70
5	******	Open Elective - 3	3	0	0	3	30	70
6	R18A1284	Mini Project	0	0	6	3	30	70
7	R18A1281	Data Warehousing And Data Mining Lab	0	0	3	1.5	30	70
8	R18A0590	Linux Programming Lab	0	0	3	1.5	30	70
9*	R18A0007	Constitution Of India	2	0	0	0	100	-
TOTAL			**17**	**0**	**12**	**21**	**340**	**560**

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

IV Year B.Tech (IT) - I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1205	Application Programming	3	0	0	3	30	70
2	R18A1206	Mobile Application Development	3	0	0	3	30	70
3	R18A0524	Cloud Computing	3	0	0	3	30	70
4	R18A1207	Business Data Analytics	3	0	0	3	30	70
6	R18A0527 R18A0532 R18A0523	Professional Elective 3: 1. Machine Learning 2. Internet of Things 3. Software Testing Methodologies	3	0	0	3	30	70
6	R18A1282	Application Programming Lab	0	0	3	1.5	30	70
7	R18A1283	Mobile Application Development Lab	0	0	3	1.5	30	70
8	R18A1285	Project-1	0	0	6	3	30	70
TOTAL			**15**	**0**	**12**	**21**	**240**	**560**

IV Year B.Tech (IT) - II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1208	Tools and Techniques of Data Sciences	3	0	0	3	30	70
2	R18A0536 R18A1209 R18A0529	Professional Elective 4: 1. Image Processing 2. Adhoc and Sensor Networks 3.Service Oriented Architecture	3	0	0	3	30	70
3	R18A1210 R18A0535 R18A1211	Professional Elective 5: 1. Advanced Databases 2. Distributing Trust And Block Chain Technology 3. Middleware Technologies	3	0	0	3	30	70
4	R18A1286	Project - 2	0	0	12	6	60	140
TOTAL			**09**	**0**	**12**	**15**	**150**	**350**

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

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	Operation Research

OPEN ELECTIVE – 3

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I- SEM -IT **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 – IT

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 - IT

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- IT

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- IT

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

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(R18A0082) IT WORKSHOP LAB

OBJECTIVES:

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

PC HARDWARE

Week 1:

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral

Week 2:

Assembling and disassembling of PC

Week 3:

Every student should individually install MS windows on the personal computer. Basic DOS Commands

Week 4: Hardware Troubleshooting

Students have to be given a PC which does not boot due to improper assembly or defective peripherals Software Troubleshooting: Students have to be given amalfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

Week 5: INTERNET & WEB BROWSERS

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers And How to access the websites and email& Search Engines & various threats on the internet and would be asked to configure their computer to be safe on the internet, Antivirus downloads to avoid viruses and/or worms.

MS OFFICE

Week 6: MICROSOFT WORD

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

Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

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

Week 7: MICROSOFT EXCEL

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

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

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

Week 8: MICROSOFT POWER POINT

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

Create the presentation using the following tools:

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

Header and Footer

Bullets and Numbering

Drawing Toolbar: Auto shapes, Textboxes, etc

Design Template

Introduction to custom animation.

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

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

Week 9: **HTML**

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

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

TEXT BOOKS:

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

OUTCOMES:

1. The Students are able to identify the major components of a computer and its basic peripherals. They are capable of assembling a personal computer, and can perform installation of system software like MS Windows and required device drivers.

2. Students can detect and perform minor hardware and software level troubleshooting.
3. The Students are capable of working on Internet & World Wide Web and can make effective usage of the internet for academics.
4. The Students develop ability to prepare professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools.
5. The students are able to create a static webpage's using HTML.

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(R18A0581) PROGRAMMING FOR PROBLEM SOLVING LAB

OBJECTIVES:

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

Week 1:

a) Write a C program to find sum and average of three numbers.

b) Write a C program to find the sum of individual digits of a given positive integer.

Week 2:

a) Write a C program to generate the first n terms of the Fibonacci sequence.

b) Write a C program to generate prime numbers from 1 to n.

c) Write a C program to check whether given number is Armstrong Number or not.

Week 3:

a) Write a C program to check whether given number is perfect number or not.

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

Week 4:

a) Write a C program to find the roots of a quadratic equation.

b) Write a C program to perform arithmetic operations using switch statement.

Week 5:

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

b) Write a C program to find factorial of a given integer using recursive function.

Week 6:

a) Write C program to find GCD of two integers by using recursive function.

b) Write C program to find GCD of two integers using non-recursive function.

Week 7:

a) Write a C program to find both the largest and smallest number in a list of integers.

b) Write a C program to Sort the Array in an Ascending Order

c) Write a C program to find whether given matrix is symmetric or not.

Week 8:

Revision of programs

Week 9:

a) Write a C program to perform addition of two matrices.

b) Write a C program that uses functions to perform multiplication of two Matrices.

Week 10:

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

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

Week 11:

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

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

Week 12:

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

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

Week 13:

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

Week 14:

Revision of Programs

TEXT BOOKS

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

OUTCOMES:

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

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(R18A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

OBJECTIVES:

1. To expose students to a variety of self-instructional, learner-friendly modes of language learning
2. To enable students to learn accurate pronunciation through stress on word accent, intonation and rhythm.
3. To enable students to overcome public speaking anxiety and equip them to become employable.
4. To familiarize students with formal telephonic expressions by means of appropriate tone.
5. To foster sentence-level and holistic understanding of the context through active listening.

Syllabus: English Language Communication Skills Lab has two parts:

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

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

UNIT –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants- Transcriptions
ICS Lab: Ice-Breaking Activity - JAM Session- Greetings – Taking Leave – Introducing Oneself and Others.

UNIT –II

CALL Lab: Syllabification - Stress &Intonation- Rules of Stress Markings and Intonation
ICS Lab: Situational Dialogues/Role Plays - Making Requests and Seeking Permissions.

UNIT –III

CALL Lab: Listening Activities (Its Importance – Purpose- Process- Listening for General and Specific Details.)
ICS Lab: Communication at Work Place - Professional Etiquettes, Telephone Etiquette.

ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

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

System Requirement (Hardware component):

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

i) P –IV Processor
   a)Speed –2.8 GHZ
   b)RAM –512 MB Minimum
   c)HardDisk –80 GB
ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

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

OUTCOMES:

Students will be able to:

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

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(R18A0002) PROFESSIONAL ENGLISH

OBJECTIVES:

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

UNIT-I

Listening - Bill Gate's TED talk on Solving Big Problems
Speaking - Description of Pictures, Places, Objects and Persons
Grammar - Finite and Non-finite verbs
Vocabulary - Business Vocabulary
Writing - Paragraph Writing

Unit –II

Listening - Google CEO Sundar Pichai's Speech I/O 2017 Keynote
Speaking - Oral presentations
Grammar - Transformation of Sentences
Vocabulary - Idioms
Writing - Abstract Writing

Unit –III

Listening - Sample Interviews (videos)
Speaking - Mock Interviews
Grammar - Direct and Indirect Speech
Vocabulary - Standard Abbreviations (Mini Project)
Writing - Job applications I (Cover Letter)

Unit – IV

Listening - Telephonic Interviews
Speaking - Telephonic Expressions
Grammar - Auxiliary verbs
Vocabulary - Word Analogy-I
Writing - Job Application II (Resume)

Unit – V

Listening - Tanmay Bhakshi's ITU interview
Speaking - Professional Etiquette
Grammar - Common Errors
Vocabulary - Word Analogy-II
Writing - Report Writing

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

OUTCOMES:

Students will be able to:

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

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(R18A0022) MATHEMATICS-II

OBJECTIVES:

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

UNIT – I:

Solutions of algebraic, transcendental equations and Interpolation

Solution of algebraic and transcendental equations: Introduction, Bisection Method, Method of false position, Newton Raphson method and their graphical interpretations.

Interpolation: Introduction, errors in polynomial interpolation, Finite differences - Forward differences, backward differences, central differences. Newton's formulae for interpolation, Gauss's central difference formulae. Interpolation with unevenly spaced points - Lagrange's Interpolation.

UNIT – II:

Numerical Methods

Numerical integration: Generalized quadrature - Trapezoidal rule, Simpson's $1/3^{rd}$ and Simpson's $3/8^{th}$ rules.

Numerical solution of ordinary differential equations: Solution by Taylor's series method, Euler's method, Euler's modified method, Runge-Kutta fourth order method.

Curve fitting: Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares.

Unit III:

Beta and Gamma functions

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

Unit IV:

Double and Triple Integrals

Double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar).

Unit V:

Vector Calculus

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

and Gauss's Divergence Theorems (Statement & their Verification).

TEXT BOOKS:

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

REFERENCE BOOKS:

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

OUTCOMES:

After learning the contents of this paper the student must be able to

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

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(R18A0013) ENGINEERING CHEMISTRY

OBJECTIVES:

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

UNIT-I:

Electrochemistry and Corrosion

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

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

UNIT -II:

Atomic and Molecular Structure

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

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

UNIT -III:

Water and its Treatment

Hardness of water- Types and units of hardness; Estimation of hardness of water by EDTA method; Softening of water by Ion exchange process; Potable water- specifications, methods of 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, 16thEdition, 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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(R18A0582)OBJECT ORIENTED PROGRAMMING LAB

OBJECTIVES:

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

Week 1:

Basic C++ Programs

Week2:

a) Write a C++ program to find the sum of individual digits of a positive integer.
b) Write a C++ program to generate the first n terms of the sequence.

Week 3:

a) Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
b) Write a C++ program to find both the largest and smallest number in a list of integers.

Week 4:

a) Write a C++ program to sort a list of numbers in ascending order.
b) Write a Program to illustrate New and Delete Keywords for dynamic memory allocation

Week 5

a) Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
b) Program to illustrate default constructor, parameterized constructor and copy constructors
c) Write a Program to Implement a Class STUDENT having Following Members:

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

Week 6:

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

Week 7:

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

Week 8:

Revision laboratory

Week 9

Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:

a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.

d) Subtraction of matrices. e) Multiplication of matrices

Week 10

Write C++ programs that illustrate how the following forms of inheritance are supported:

a)Single inheritance b)Multiple inheritance c)Multi level inheritance d)Hierarchical inheritance

Week 11

a.)Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.

b) Write a Program to Invoking Derived Class Member Through Base Class Pointer.

Week 12

a) Write a Template Based Program to Sort the Given List of Elements.

b) Write a C++ program that uses function templates to find the largest and smallest number in a list of integers and to sort a list of numbers in ascending order.

Week 13

a) Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.

b) Write a Program to Demonstrate the Catching of All Exceptions.

Week 14

Revision

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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(R18A0281) BASIC ELECTRICAL ENGINEERING LAB

OBJECTIVES:

To Design Electrical Systems.

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

CYCLE –I

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

CYCLE-II

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

NOTE: Any 10 of Above Experiments Are To Be Conducted

OUTCOMES:

After successfully studying this course, students will:

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

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(R18A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVE

(Mandatory Course)

OBJECTIVES:

This introductory course input is intended:

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

UNIT - I:

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

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

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

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

UNIT - II:

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

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

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

UNIT - III:

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

Understanding the meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the

other salient values in relationship.

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

UNIT - IV:

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

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

UNIT - V:

Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:

a. Ability to utilize the professional competence for augmenting universal human order.
b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Relevant CDs, Movies, Documentaries & Other Literature:

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

OUTCOMES:

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

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(R18A1201) COMPUTER ORGANIZATION AND ARCHITECTURE

Objectives:

The students will be exposed:

1. To how the Computer Systems work and its basic principles
2. To Instruction Level Architecture and Instruction Execution and memory system design
3. To how the I/O devices are accessed and its principles.
4. To Instruction Level Parallelism and knowledge on micro programming
5. To the concepts of advanced pipelining techniques.

UNIT - I:

Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Computer Organization and Architecture - Von Neumann

Data representation: signed number representation, fixed and floating point Representations, Character representation. Computer arithmetic – integer addition and Subtraction, Ripple carry adder, carry look-ahead adder, etc. Multiplication – shift-and add, Booth multiplier, Carry save multiplier, etc. Division restoring and non-restoring techniques, Floating point arithmetic.

UNIT – II:

Introduction to x86 architecture.

Instruction set architecture of a CPU: Registers, instruction execution cycle, RTL Interpretation of instructions, addressing modes, instruction set.

CPU Control unit design: Hardwired and micro-programmed design approaches

UNIT – III:

Memory system design: Semiconductor memory technologies, memory organization.

Memory organization: Memory interleaving, concept of hierarchical memory organization, Cache memory, cache size vs. block size, mapping functions, Replacement algorithms, write policies.

UNIT – IV:

Peripheral devices and their characteristics: Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB

UNIT – V:

Pipelining: Basic concepts of pipelining, throughput and speedup, pipeline hazards. **Parallel Processors**: Introduction to parallel processors, Concurrent access to memory and cache coherency.

TEXT BOOKS:

1. “Computer Organization and Design: The Hardware/Software Interface”, 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
2. “Computer Organization and Embedded Systems”, 6th Edition by CarlHamacher,McGraw Hill Higher Education.

REFERENCE BOOKS:

1. “Computer Architecture and Organization”, 3rd Edition by John P. Hayes,WCB/McGraw-Hill
2. “Computer Organization and Architecture: Designing for Performance”, 10th Editionby William Stallings, Pearson Education.
3. “Computer System Design and Architecture”, 2nd Edition by Vincent P. Heuringand Harry F. Jordan, Pearson Education.

Course Outcomes :

1. Draw the functional block diagram of a single bus architecture of a computer anddescribe the function of the instruction execution cycle, RTL interpretation ofinstructions, addressing modes, instruction set.
2. Write assembly language program for specified microprocessor for computing16 bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication).
3. Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
4. Given a CPU organization and instruction, design a memory module and analyze its operation by interfacing with the CPU.
5. Given a CPU organization, assess its performance, and apply design techniques to enhance performance using pipelining, parallelism and RISC methodology

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(R18A0503) DATA STRUCTURES

Objectives :

The students will be able:

1. To learn the basic concepts of data structures and algorithms.
2. To understand concepts about searching and sorting techniques
3. To gain knowledge of implementation of stacks, queues, lists, trees and graphs.
4. To learn algorithms for solving problems with the help of data structures

UNIT - I:

Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Searching: Linear Search and Binary Search Techniques and their complexity analysis.

UNIT - II:

Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

UNIT - III:

Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis.

UNIT - IV:

Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis.

UNIT - V:

Sorting and Hashing: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing.

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

TEXT BOOKS:

1. “DATA STRUCTURES USING C++” ,special edition MRCET,McGraw Hill publications 2017

2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.

3. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons

REFERENCE BOOKS:

1. Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company

2. "How to Solve it by Computer", 2nd Impression by R. G. Dromey, Pearson Education.

CourseOutcomes :

1. For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness.
2. For a given Search problem (Linear Search and Binary Search) student will able to implement it.
3. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
4. Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort,Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.
5. Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

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(R18A0504) OPERATING SYSTEMS

Objectives:

Students will be able:

1. To learn the mechanisms of OS to handle processes and threads and their communication
2. To learn the mechanisms involved in memory management in contemporary OS
3. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
4. To know the components and management aspects of concurrency management

UNIT - I:

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.

UNIT - II:

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching

Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR.Multiprocessor scheduling: Real Time scheduling: RM and EDF.

UNIT - III:

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem etc.

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

UNIT - IV:

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, Protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU).

UNIT - V:

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks

TEXT BOOKS:

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

REFERENCE BOOKS:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley
3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India
4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates

Course Outcomes :

At the end of the course students will be able to:

1. Create processes and threads.
2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.
3. For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
4. Design and implement file management system.
5. Develop the I/O management functions in OS for the given I/O devices and OS.

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(R18A506) DISCRETE MATHEMATICS

OBJECTIVES:

- Use mathematically correct terminology and notation.
- Construct correct direct and indirect proofs.
- Use division into cases in a proof.
- Use counterexamples.
- Apply logical reasoning to solve a variety of problems.

UNIT-I

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, Normal Forms, Disjunctive and Conjunctive Normal Form, The use of Quantifiers.

Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency.

UNIT-II

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem, Schroeder-Bernstein theorem.

Principles of Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

UNIT-III

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function.

UNIT-IV

Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination.

UNIT-V

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Shortest distances.

TEXT BOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw – Hill
2. Susanna S. Epp, Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co. Inc.
3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by, Tata McGraw – Hill.

REFERENCE BOOKS:

1. J.P. Tremblay and R. Manohar, “Discrete Mathematical Structure and It’s Application to Computer Science”, TMG Edition, TataMcgraw-Hill
2. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press. Schaum’s Outlines Series, Seymour Lipschutz, Marc Lipson,
3. Discrete Mathematics, Tata McGraw – Hill

OUTCOMES:

At the end of the course the students are able to:

- For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives
- For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference
- For a given a mathematical problem, classify its algebraic structure
- Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra
- Develop the given problem as graph networks and solve with techniques of graph theory.

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(R18A0024) PROBABILTY AND STATISTICS

Objectives:

The students will learn:

1. To do Differentiation and Integration of complex valued functions. Evaluation of integrals using Cahchy's integral formula.
2. To work Taylor's series, Maclaurin's series and Laurent's series expansions of complex functions Evaluation of integrals using residue theorem
3. To identify distribution in certain realistic situation. It is mainly useful for circuit as well as non circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
4. To calculate mean and proportions(small and large samples)and to make important decisions from few samples which are taken out of unmanageably huge populations.It is mainly useful for non-branches of engineering.

UNIT – I:

Complex Functions, Differentiation and Integration: Complex functions and its representation on Argand plane, Concepts of limit Continuity, Differentiability, Analyticity, Cauchy-Riemann conditions, Harmonic functions, Milne-Thompson method. Cauchy's integral theorem - Cauchy's integral formula - Generalized integral formula.

UNIT – II:

Power series expansions of complex functions and contour Integration: Radius of convergence - Expansion in Taylor's series, Maclaurin's series and Laurent series (without proof). Singular point - Isolated singular point - pole of order m - essential singularity. Residue, Evaluation of residue by formula and by Laurent series, Residue theorem, Bilinear transformation.

UNIT – III:

Random Variables and Probability Distributions: Random variables - Discrete and Continuous. Probability distribution function, mass function and density function of probability distribution.

Binomial distribution - properties, mean and variance, Poisson distribution - properties, mean and variance and Normal distribution - properties, mean and variance

UNIT –IV:

Sampling Distributions and Statistical Inferences: Sampling: Definitions of population, sampling, statistic, parameter - Types of sampling - Expected values of sample mean and variance, Standard error - Sampling distribution of means and variance. Estimation - Point estimation and Interval estimation.

Testing of hypothesis: Null and Alternative hypothesis - Type I and Type II errors, Critical region - confidence interval - Level of significance, One tailed and Two tailed test.

Large sample Tests: Test of significance - Large sample test for single mean, difference of means, single proportion, difference of proportions.

Unit-V:

Small samples : Test for single mean, difference of means, test for ratio of variances (F-test) - Chi-square test for goodness of fit and independence of attributes.

Text /Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
2. Engineering Mathematics – III by T.K.V Iyenger, B.Krishna Gandhi and Others, S Chand Publishers.
3. Probability and Statistics by T.K.V Iyenger ,B.Krishna Gandhi and Others, S Chand Publishers.
4. Fundamental of Statistics by S.C. Gupta ,7th Edition,2016.

Course Outcomes:

1. Analyze the complex functions with reference to their analyticity, Integration using Cauchy's integral theorem.
2. Find the Taylor's and Laurent series expansion of complex functions
3. Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be either discrete or continuous type.
4. In the discrete case, study of the binomial and the Poisson random variables and the normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
5. The types of sampling, Sampling distribution of means, Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.

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(R18A0461) ANALOG AND DIGITAL ELECTRONICS

Objectives:

The students will be able:

1. To familiarize with the principle of operation, analysis and design of junction diode and BJT.
2. To understand concepts of basic number systems, codes and logical gates.
3. To learn the methods for simplifying Boolean expressions
4. To understand the formal procedures for the analysis and design of combinational circuits and sequential circuits

UNIT-I:

P-N Junction diode: Qualitative Theory of P-N Junction, P-N Junction as a diode , diodeequation, volt-ampere characteristics temperature dependence of V-I characteristic , ideal versus practical, diode equivalent circuits,, Zener diode characteristics.

Special purpose electronic devices: Principal of operation and Characteristics of TunnelDiode, Varactar Diode, SCR and photo diode.

UNIT-II:

BIPOLAR JUNCTION TRANSISTOR: The Junction transistor, Transistor construction,Transistor current components, Transistor as an amplifier, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations. α and β Parameters and the relation between them, BJT Specifications.

UNIT – III:

Number System and Boolean Algebra: Number Systems, Base Conversion Methods, Complementsof Numbers, Codes- Binary Codes, Binary Coded Decimal, Unit Distance Code,Digital Logic Gates (AND, NAND, OR, NOR, EX-OR, EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

UNIT-IV:

Minimization Techniques:

The Karnaugh Map Method, Three, Four and Five Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Multilevel NAND/NOR realizations.

UNIT-V:

Combinational Circuits:

Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Parallel binary adder, parallel binary Subtractor, Binary Multiplier, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

Sequential circuits:

Latches, Flip-Flops-SR, JK, D, T and master slave, characteristic tables and equations, Conversion from one type of Flip-Flop to another.

TEXT BOOKS:

1. "Electronic Devices & Circuits", Special Edition – MRCET, McGraw Hill Publications, 2017.
2. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
3. Electronic Devices and Circuits, S.Salivahanan,N.Suresh kumar, McGraw Hill.
4. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 /Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
5. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.S Publications
2. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
3. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
4. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.

Course Outcomes :

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

1. Analyze the different types of diodes, operation and its characteristics
2. Observe and analyze the BJT Transistor.
3. Apply the basic postulates of Boolean algebra and shows the correlation between Boolean expressions
4. Implement the methods for simplifying Boolean expressions
5. Apply the formal procedures for the analysis and design of combinational circuits and sequential circuits

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(R18A0583) OPERATING SYSTEMS LAB

Objectives:

Students will be able to:

1. To use linux operating system for study of operating system concepts.
2. To write the code to implement and modify various concepts in operating systems using Linux.

Week 1:

Simulate the following CPU scheduling algorithms

a. Round Robin
b. SJF
c. FCFS
d. Priority

Week 2:

Simulate all file allocation strategies

a. Sequential
b. Indexed

Week 3:

Simulate linked file allocation strategy.

Week 4:

Simulate Multiprogramming with Variable number of Tasks and Multiprogramming with Fixed number of Tasks

Week 5:

Simulate given File Organization Techniques

a. Single level directory
b. Two level

Week 6:

Simulate given File Organization Techniques

a. Hierarchical
b. DAG

Week 7:

Simulate Bankers Algorithm for Dead Lock Avoidance

Week 8:

Simulate Bankers Algorithm for Dead Lock Prevention

Week 9:

Simulate the following page replacement algorithms

a. FIF
b. LRU
c. LFU

Week 10:

Simulate Paging technique for memory management.

Week 11:

Simulate disk scheduling algorithms- Scan,C-Scan.

TEXT BOOKS :

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

Course Outcomes:

1. The course objectives ensure the development of students applied skills in operating systems related areas.
2. Students will gain knowledge in writing software routines modules or implementing various concepts of operating system.

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(R18A0584) DATA STRUCTURES LAB

Objectives:

- To make the student learn a object oriented way of solving problems.
- To make the student write ADT and implement it for all data structures.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

Week1:

Write C++ programs to implement recursive and non recursive i) Linear search ii) Binary search

Week2:

Write C++ programs to implement i) Bubble sort ii) Selection sort iii) quick sort iv) insertion sort

Week3:

Write C++ programs to implement the following using an array.

a) Stack ADT b) Queue ADT

Week4:

Write C++ programs to implement list ADT to perform following operations

a) Insert an element into a list.
b) Delete an element from list
c) Search for a key element in list
d) count number of nodes in list

Week5:

Write C++ programs to implement the following using a singly linked list.

a)Stack ADT b) Queue ADT

Week6:

Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

Week 7:

Write a C++ program to perform the following operations:

a) Insert an element into a binary search tree.
b) Delete an element from a binary search tree.
c) Search for a key element in a binary search tree.

Week8:

Write C++ programs for implementing the following sorting methods:

a) Merge sort b) Heap sort

Week9:

Write C++ programs that use recursive functions to traverse the given binary tree in

a) Preorder b) inorder and c) postorder.

Week10:

Write a C++ program to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

Week11:

Write a C++ program to perform the following operations

a) Insertion into an AVL-tree b) Deletion from an AVL-tree

Week12:

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

TEXT BOOKS :

1. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
2.Data Structures using C++, D.S. Malik, Thomson

Course Outcomes :

At the end of the course student should be able to:

1. Apply technical knowledge to design and implement different data structures and its algorithms.
2. Design algorithms and employ appropriate advanced data structures for solving Problems efficiently
3. Develop sorting and searching programs

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(R18A0004) FOREIGN LANGUAGE-FRENCH

INTRODUCTION:

Au vu de l'importance croissante des langues étrangères comme outil de communication dans certains pays du globe, le français a été identifié comme l'une des langues les plus sollicitées après l'anglais. De ce fait, tout en insistant sur la formation en compétences communicatives, le programme a été élaboré pour développer des aptitudes linguistiques et communicatives des étudiants ingénieurs. Le cours de français, sera centré sur les compétences orales de base.

OBJECTIVES:

1. To improve the basic speaking skills of the French language.
2. To hone the basic sentence constructions in day to day expressions for communication in their work place.

UNITE - I:

- Objectif communicatifs (LSRW)

-Se présenter / Présenter quelqu'un - Entrer en contact – Saluer – Epeler - poser des questions - comprendre et remplir un formulaire

- Grammaire
  - Les formules de politesse
  - L'alphabet
  - Les nombres de 1 à 20
  - Le verbe ''être'' et ''avoir'' au présent de l'indicatif
- Vocabulaire
  - Les professions
  - Les nationalités

UNITE - II:

- Grammaire
  - Les noms (genre et nombre)
  - Les articles
  - Les verbes en –er- au présent
  - Les adjectifs possessifs
  - Les adjectifs qualificatifs
  - « Qu'est ce que c'est ? » / « Qui est ce ? »/ « c'est… »
  - La négation
- Vocabulaire
  - La famille
  - Les vêtements
  - Les couleurs
  - Les nombres de 1 à 100

- La salle de classe

UNITE - III

- Grammaire
  - L'expression du temps (l'heure)
  - Les verbes en –ir- au présent
  - Les verbes faire, aller, prendre, venir,
  - Les adverbes
  - Les verbes pronominaux
- Vocabulaire
  - Les jours et les mois de l'année
  - La vie quotidienne
  - Les sports
  - Les loisirs

UNITE – IV :

- Grammaire
  - Pouvoir, vouloir
  - Exprimer la capacité / la possibilité
  - Exprimer la volonte / le désir
  - Le futur proche

- Vocabulaire
  - La nourriture
  - Les repas
  - Les fruits et légumes
  - Les parties du corps

UNITE – V :

- Grammaire
  - Les adjectifs démonstratifs
  - Les prépositions
  - Le verbe ' devoir' et 'falloir' au présent
  - « Il y a » et « Depuis »
- Vocabulaire
  - Les saisons
  - Les vacances
  - La ville
  - Le logement

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

Course outcomes:

1. The student will be in a position to speak in French, Which is the second most widely learned foreign language after English, and the ninth most widely spoken language in the world. French is also the only language, alongside English, that is taught in every country in the world.
2. The Student will get the ability to speak French is an advantage on the international job market.
3. Students with a good level of French are eligible for French government scholarships to enroll in postgraduate courses in France in any discipline and qualify for internationally recognized French degrees.

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(R18A0507) SOFTWARE ENGINEERING

Objectives:

The students will be able :

1. To comprehend the various software process models.
2. To understand the types of software requirements and SRS document.
3. To know the different software design and architectural styles.
4. To learn the software testing approaches and metrics used in software development.
5. To know about quality control and risk management.

UNIT - I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, Process patterns, process assessment.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools

UNIT - II:

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods. UML Diagrams.

UNIT - III:

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT - IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT - V:

Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, The Capability Maturity Model Integration (CMMI), Software reliability, The ISO 9000 quality standards.

TEXT BOOKS :

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.

REFERENCE BOOKS :

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
5. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
7. Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
8. Introduction to Software Engineering, R. J. Leach, CRC Press.

Course Outcomes:

Students will have the ability:

1. To compare and select a process model for a business system.
2. To identify and specify the requirements for the development of an application.
3. To develop and maintain efficient, reliable and cost effective software solutions.
4. To critically think and evaluate assumptions and arguments of the client.

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(R18A0508) FORMAL LANGUAGE AND AUTOMATA THEORY

Objectives :

The students will be able:

1. To develop a formal notation for strings, languages and machines.
2. To design finite automata to accept a set of strings of a language.
3. To design context free grammars to generate strings from a context free language and convert them into normal forms.
4. To prove equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
5. To distinguish between computability and non-computability and Decidability and undecidability.

UNIT – I:

Introduction: Alphabet, languages and grammars, productions and derivation, Regular languages and finite automata: Deterministic finite automata (DFA), nondeterministic finite automata (NFA) and equivalence with DFA, FA with output: Moore and Mealy machines

UNIT – II:

Regular expressions and Regular grammars, Regular Languages and equivalence with finite automata, FA equivalence with regular expressions, Properties of regular languages, Pumping lemma for regular languages, Minimization of finite automata.

UNIT – III:

Context-free languages and pushdown automata: Context-free grammars (CFG) and languages (CFL), Derivations, Parse trees, Ambiguity in CFG. Simplification of grammars, Chomsky and Greibach normal forms.

Push Down Automata : Nondeterministic pushdown automata (PDA). Deterministic pushdown automata, Acceptance by Null stack and final state. Equivalence with CFG, Pumping lemma for context-free languages,Closure properties of CFLs.

UNIT – IV:

Context-sensitive languages: Context-sensitive grammars (CSG) and languages, Linear bounded automata and equivalence with CSG. Chomsky hierarchy of languages. Turing machines: The basic model for Turing machines (TM), Turing recognizable (Recursively enumerable) and Turing-decidable (recursive) languages and their closure properties,

UNIT – V:

Variants of Turing machines, Nondeterministic TMs and equivalence with deterministic TMs, unrestricted grammars and equivalence with Turing machines, TMs as enumerators. **Undecidability**: Church-Turing thesis, universal Turing machine, the universal and diagonalization languages, PCP problem, Reduction between languages and Rice's theorem, Undecidable problems about languages.

TEXT BOOKS:

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.

REFERENCE BOOKS:

1. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia.
2. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.
3. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.
4. John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill.

Course Outcomes:

1. Write a formal notation for strings, languages and machines.
2. Design finite automata to accept a set of strings of a language.
3. For a given language determine whether the given language is regular or not.
4. Design context free grammars to generate strings of context free language.

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(R18A0509) JAVA PROGRAMMING

Objectives:

The students will be able:

1. To understand object oriented principles like abstraction, encapsulation, inheritance, polymorphism and apply them in solving problems.
2. To understand the implementation of packages and interfaces.
3. To know the concepts of exception handling, multithreading and collection classes.
4. To understand how to connect to the database using JDBC.
5. To understand the design of Graphical User Interface using applets and swing controls.

UNIT - I:

OOPConcepts:-Data abstraction, encapsulation, inheritance, Benefits of Inheritance, Polymorphism, Classes and objects, Procedural and object oriented programming paradigms, The software development process.

JavaProgramming-History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Type conversion and casting, Enumerated types, Control flow-block scope, conditional statements, loops, break and continue statements, simple java standalone programs, arrays, console input and output, constructors, methods, static fields and methods, access control, this reference, overloading methods and constructors ,recursion, exploring string class.

Memory Management- garbage collection

Abstract data types and their specification- Concrete state space, concrete invariant, abstraction function. Implementing operations, illustrated by the Text example.

UNIT - II :

Inheritance – Inheritance hierarchy, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

Polymorphism – dynamic binding, method overriding, abstract classes and methods**.**

Interfaces- Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface, inner class.

Packages- Defining, creating and accessing a package, CLASSPATH, importing packages.

UNIT - III :

Exception handling- Dealing with errors, benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.

Multithreading – Differences between multiple processes and multiple threads, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern.

UNIT - IV :

Collection Framework in Java – Introduction to java collections, Overview of java collection framework, Commonly used collection classes- Array List, Vector, Hash table, Stack.

Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, File management using File class.

Connecting to Database – JDBC Type 1 to 4 drivers, Connecting to aa database, querying a database and processing the results, updating data with JDBC.

UNIT - V :

GUI Programming with Scala and Swing - The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Overview of some Swing components – Jbutton, JLabel, JTextField, JTextArea, simple Swing applications, Layout management – Layout manager types – border, grid and flow

Event Handling- Events, Event sources, Event classes, Event Listeners, Delegation event model, Examples: Handling Mouse and Key events, Adapter classes.

Applets – Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet, Passing parameters to applets.

Design Patterns – Introduction and Classification

Example Design Patterns -The iterator pattern, Model-view-controller pattern, Commands as methods and as objects, Implementing OO language features.

TEXT BOOK:

1. Java Fundamentals– Comprehensive Introduction, Herbert Schildt and DaleSkrien, TMH.

REFERENCE BOOKS:

1. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel,PHI
2. ObjectOrientedProgrammingthroughJava,P.RadhaKrishna,UniversitiesPress.
3. Thinking in Java, Bruce Eckel,PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.
5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides.

Course Outcomes:

1. An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs that satisfy their requirements;
2. Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
3. Demonstrate the ability to use simple datastructures like arrays in a Java program.
4. Be able to make use of members of classes found in the JavaAPI (such as the Math class).
5. Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
6. Able to develop applications using Applet, AWT, JDBC and Swings

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(R18A0510) DATABASE MANAGEMENT SYSTEMS

Objectives:

The students will be able :

1. To Understand the basic concepts and the applications of database systems
2. To learn 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 know the various database storage structures and access techniques

UNIT - I:

Database System Applications, Purpose of Database Systems, View of Data – Data Abstraction – Instances and Schemas – Data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – Database Users and Administrator – Transaction Management – Database Architecture – Storage Manager – the Query Processor.

Introduction to the Relational Model – Structure – Database Schema, Keys – Schema Diagrams.

Database design and ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design with relevant Examples. Relational Query Languages, Relational Operations.

UNIT - II:

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple Relational Calculus (TRC) – Domain relational calculus (DRC).

Overview of the SQL Query Language – Basic Structure of SQL Queries, Set Operations, Aggregate Functions – GROUPBY – HAVING, Nested Sub queries, Views, Triggers, Procedures.

UNIT - III:

Normalization – Introduction, Non loss decomposition and functional dependencies, First, Second, and third normal forms – dependency preservation, Boyce/Codd normal form.

Higher Normal Forms - Introduction, Multi-valued dependencies and Fourth normal form, Join dependencies and Fifth normal form

UNIT - IV:

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

UNIT - V:

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Check Points - Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems-ARIES Algorithm, Remote Backup systems.

File organization – various kinds of indexes - B+ Trees- Query Processing – Relational Query Optimization.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, McGraw hill, Sixth Edition.(All UNITS except III th)
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.

REFERENCE BOOKS:

1. Fundamentals of Database Systems, Elmasri Navathe Pearson Education.
2. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson, Eight Edition for UNIT III.

Course Outcomes:

At the end of the course the student will be able to:

1. Demonstrate the basic elements of a relational database management system
2. Express an ability to identify the data models for relevant problems
3. Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data
4. Apply normalization for the development of application software

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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 analyze the financial formats of the organization 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.

REFERENCE BOOKS:

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.

Course outcomes:

Students will able:

1. To apply the basic economic principles, forecast the demand and supply
2. To estimate cost and understand market structure and pricing practices
3. To interpret the financial results of the organization

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(R18A0585) JAVA PROGRAMMING LAB

OBJECTIVES:

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP, JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.

Week 1: A) Write a java program to find the Fibonacci series using recursive and non recursive functions.
B) Write a java program to multiply two given matrices.

Week 2: A) Write a java program for Method overloading and Constructor overloading.
B) Write a java program to display the employee details using Scanner class.
C) Write a java program that checks whether a given string is palindrome or not.

Week 3: A) Write a java program to represent Abstract class with example.
B) Write a java program to implement Interface using extends keyword.

Week 4: Write a java program to create user defined package.

Week 5: A) Write a java program to create inner classes.
B) Write a java program for creating multiple catch blocks.

Week 6: A) Write a java program for producer and consumer problem using Threads.
B) Write a Java program that implements a multi-thread application that has three threads.

Week 7: A) Write a java program to display File class properties.
B) Write a java program to represent ArrayList class.

Week 8: Write a Java program loads phone no, name from a text file using hash table.

Week 9: Write an applet program that displays a simple message.
A) Write a Java program compute factorial value using Applet.
B) Write a program for passing parameters using Applet.

Week 10: Write a java program for handling Mouse events and Key events

Week 11: A) Write a java program that connects to a database using JDBC

B) Write a java program to connect to database using JDBC &insert values into table

C) Write a java program to connect to a database using JDBC and delete values from table.

Week 12: Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digits and for the + - * % operations. Add a text field to display the result.

TEXT BOOK:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

REFERENCE BOOKS:

1. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI

OUTCOMES:

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and report results.
- Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets programs

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(R18A0086) DATABASE MANAGEMENT SYSTEMS LAB

Objectives:

Students will have the ability to:

1. Keep abreast of current developments to continue their own professional development.
2. To engage themselves in lifelong learning of Database management systems theories and technologies.
3. Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications

A. Practice on SQL Queries to acquire knowledge on RDBMS.

B. Case Study:

Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database -Roadway travels". Students are expected to use "Mysql" database.

Roadway Travels: "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations
- **Reservations & Cancellation:**

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like 1. Analyzing the problem and identifying the Entitites and Relationships, 2. E-R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

Entities:

1. B U S
2. Ticket
3. Passenger

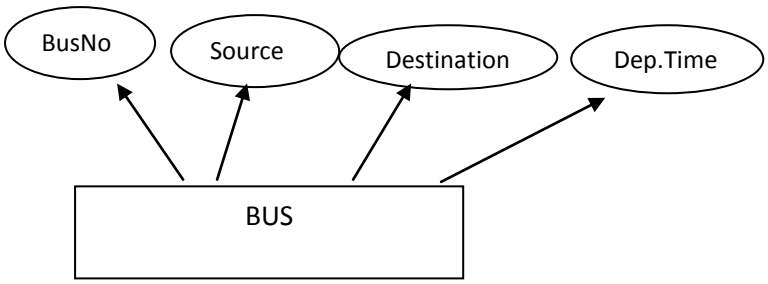
Relationships:

1. Reservation
2. Cancellation

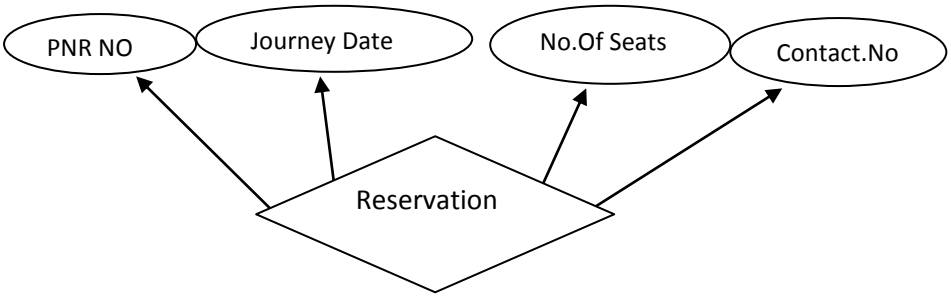
PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO(Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.



Ex: Bus Entity



Ex: Reservation relationship

Note: ***The student is required to submit a document by writing the Entities and Keys to the lab teacher***

Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total/partial).Try to incorporate Generalization, Aggregation,
Specialization etc wherever required.

Note*:* The student is required to submit a document by drawing the E-R diagram to the lab teacher.

Experiment 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion.

Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attribute as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued and Derived) have different way of Representation.

Example: The passenger looks as below .This is an example.
You can add more attributes based on your E-R-Model
This is not normalized table.

Passenger

Name	Age	Sex	Address	Ticket_id	Passport ID

Note: The student is required to submit a document by represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.
For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger

Name	Age	Sex	Address	Passport ID

Passport_id	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment 5: Installation of Mysql and practicing DDL, commands

Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.
Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger (
Passport_id INTEGER PRIMARY KEY,
   Name VARCHAR (50) Not NULL,
   Age Integer Not NULL,
```

Sex Char,
Address VARCHAR (50) Not NULL);
Similarly create all other tables.
Note: Detailed creation of tables is given at the end.

Experiment 6: Practicing DML commands
DML commands are used to for managing data within schema objects.
Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for

The records remain
Inserting values into "Bus" table:
Insert into Bus values(1234,'hyderabad', ‘tirupathi');
Insert into Bus values (2345,’hyderabd’ ‘Banglore’);
Insert into Bus values (23,'hyderabd','Kolkata');
Insert into Bus values (45,'Tirupathi,'Banglore');
Insert into Bus values (34,'hyderabd','Chennai');

Inserting values into "Passenger" table:
Insert into Passenger values (1, 45,'ramesh', 45,’M', ‘abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');
Insert into Passenger values (45, 90,' ram', 30,'M','abc12');
Insert into Passenger values (67, 89,' ravi', 50,'M','abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

Few more Examples of DML commands:
Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 7: Querying
In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.
Practice the following Queries:
Display unique PNR_no of all Passengers.
Display all the names of male passengers.
Display the ticket numbers and names of all the passengers.
Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
Find the names of passengers whose age is between 30 and 45.
Display all the passengers names beginning with 'A'
Display the sorted list of passengers names

Experiment 8 and Experiment 9: Querying (continued...)
You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.
Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.
Find the distinct PNR numbers that are present.
Find the number of tickets booked by a passenger where the number of seats is greater than 1.Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
Find the total number of cancelled seats.

Experiment 10: **Triggers**
In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.
Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger
FOR EACH ROW BEGIN

IF NEW.Tickent N0 > 60 THEN SET New.Tickent no = Ticket no;
ELSE
SET New.Ticket no = 0;
END IF;
END;

Experiment 11: Stored Procedures
In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.
Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;

Experiment 12: PL/SQL
In this session you are going to learn PL/SQL programs with Oracle Database

Experiment 13: DCL Commands
DCL commands are used to for granting the permissions for security of data within the users.

Reference Books:
1. Introduction to SQL,Rick F.Vander Lans,Pearson education..
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearson education.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming,M.Mc Laughlin,TMH.
6. SQL Fundamentals, J.J.Patrick,Pearson Education.

Course Outcomes:
Students will be able to demonstrate their skills
1. In drawing the ER, EER, and UML Diagrams.
2. In analyzing the business requirements and producing a viable model for the implementation of the database.

3. In converting the entity-relationship diagrams into relational tables.
4. To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

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(R18A0014) ENVIRONMENTAL SCIENCES (Mandatory Course)

Course Objectives:

1. To understand the importance of ecological balance for sustainable development
2. To know 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 know the significance of waste management

UNIT I- ENVIRONMENTAL EDUCATION AND ECOSYSTEMS [6 periods]

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 [6 periods]

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 [10 periods]

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 [6 periods]

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 [6 periods]

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.

SUGGESTED 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.

Course 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 ELECTIVE - I

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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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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

Course 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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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 BOOKS:

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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OPEN ELECTIVE - I
(R18A0351) ELEMENTS OF MECHANICAL ENGINEERING

OBJECTIVES:

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

UNIT - I

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

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

UNIT - II

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

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

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

UNIT - III

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

Hydraulic pumps and turbines: working principles and velocity diagrams.

UNIT - IV

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

UNIT - V

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

OUTCOMES:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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

OPEN ELECTIVE - I
(R18A0352) GREEN ENERGY SYSTEMS

OBJECTIVES:

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

UNIT-I

Introduction:

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

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

UNIT – II

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

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

UNIT – III

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

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

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

UNIT –IV

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

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

UNIT-V

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

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

TEXT BOOKS:

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

REFERENCES:

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

OUTCOMES:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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

OPEN ELECTIVE - I

(R18A0051) INTELLECTUAL PROPERTY RIGHTS

OBJECTIVES:

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

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

OUTCOMES:

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

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]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

Time: 3 hours **MATHEMATICS-I (R18A0021)** **Max Marks: 70**

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

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

SECTION-I

Q.NO: 1 a) Define Rank of a Matrix. Find the rank of the matrix A = $\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & -4 \\ 2 & 3 & 5 & -5 \\ 3 & -4 & -5 & 8 \end{bmatrix}$ by reducing into canonical form or normal form. [7M]

b) Discuss for what values of λ, μ the simultaneous equations x + y + z = 6, x+2y+3z =10, x+2y+λz = μ have (i). No solution (ii). A unique solution (iii). An infinite number of solutions [7M]

OR

Q.NO: 2 a) Find the Eigen values and Eigen vectors of the matrix is $\begin{bmatrix} 3 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ [14M]

SECTION-II

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

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 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]

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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]

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UG Model question paper

Time: 3 hours **APPLIED PHYSICS (R18A0013)** **Max Marks: 70**

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

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

SECTION-I

Q.NO: 1 a) Derive the time independent Schrödinger's wave equation. [10M]

b) Write short notes on Heisenberg's uncertainty principle [4M]

OR

Q.NO: 2 a) Show that the wavelength λ associated with a electron of mass m is given by $\lambda = \frac{h}{\sqrt{2mE}}$ [10 M]

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

SECTION-II

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

OR

Q.NO: 4 a) Derive an expression for density of states. [10M]

b) Explain E – K diagram. [4M]

SECTION-III

Q.NO: 5 a) Derive an expression for concentration of electrons in n type semiconductor. [8M]

b) Distinguish direct and indirect band gap semiconductors [6M]

OR

Q.NO: 6 a) Define Hall Effect and derive an expression for hall coefficient? [10M]

b) The hall coefficient of a specimen is 7.35×10^{-5} m^3/cm, then find the nature of semiconductor and concentration of charge carriers. [4M]

SECTION-IV

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

OR

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

b) Explain soft and hard magnetic materials. [6M]

SECTION-V

Q.NO: 9 a) Derive the relation between Einstein's coefficients [8M]

b) Write short notes on population inversion [6M]

OR

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

b) For an optical fiber the refractive indices of core and cladding are 1.50 and 1.41 then determine numerical aperture and acceptance angle of the optical fiber assuming that light is launched into optical fiber from air medium. [4M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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

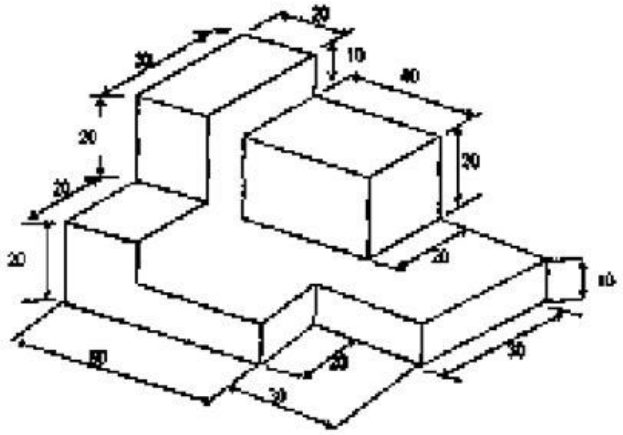
Q.NO: 7 Draw the isometric view of a hexagonal prism of base side 30 mm and axis 70mm. the prism is resting on its base on the H.P. with an edge of the base parallel to the V.P. [14 M]

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

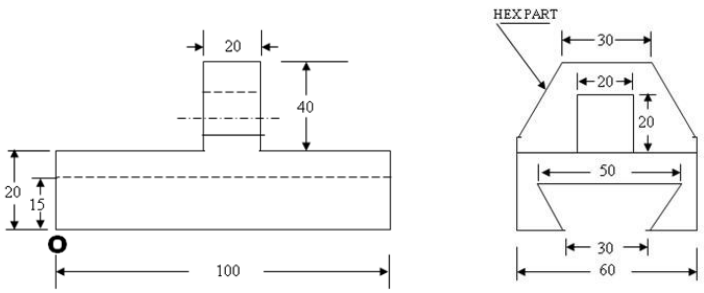
Q.NO: 9 Draw the orthographic projections for the pictorial view shown in figure All dimensions are in mm [14 M]



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]

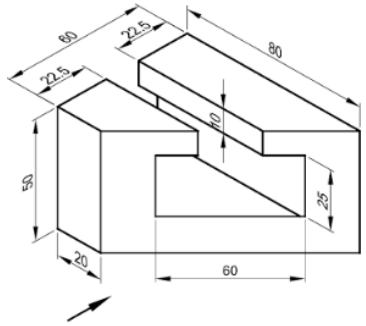
OR

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]

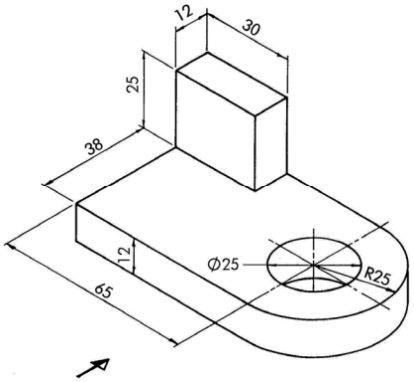
SECTION IV

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

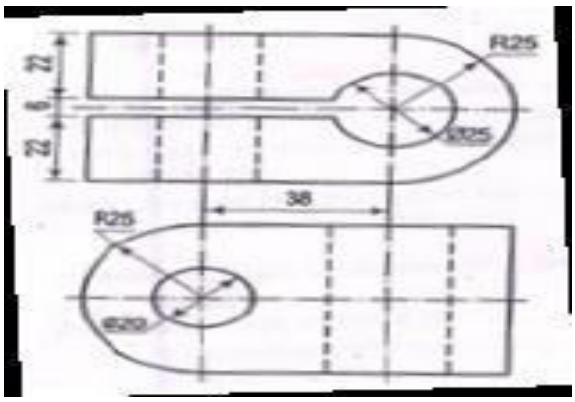


OR

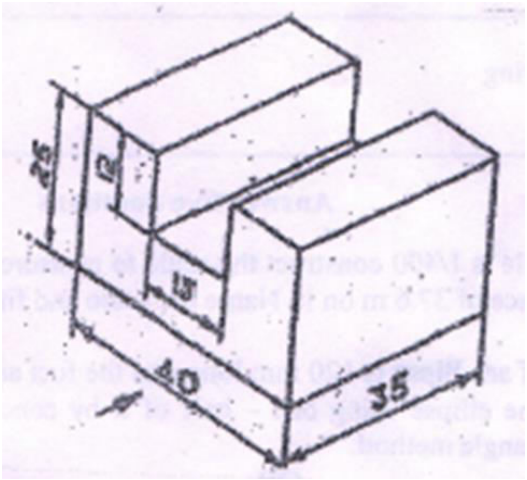
Q.NO: 8 Draw three views of the following component in first angle projection. Take all dimensions are in mm.



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]

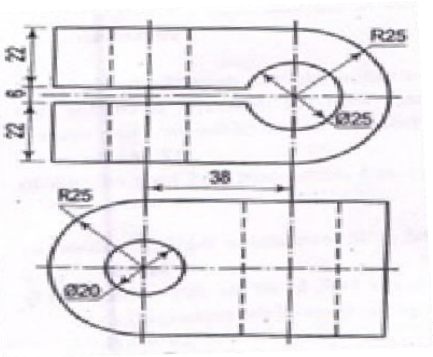

Figure 1

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

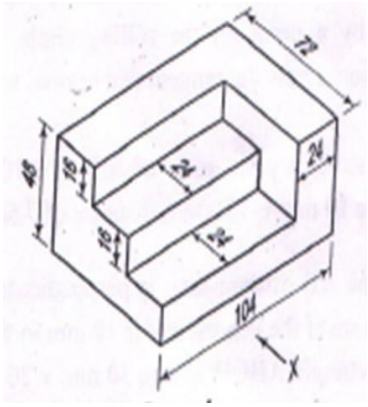

Figure 2

OR

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

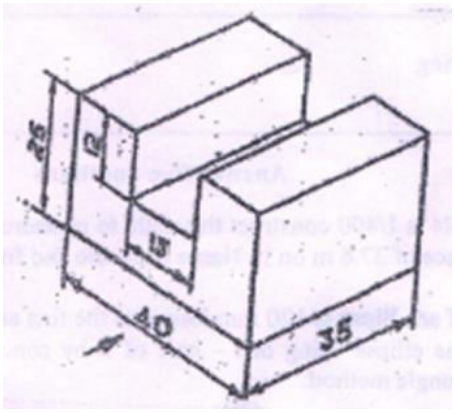

Figure 3

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]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

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

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

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

SECTION-I

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

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

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

OR

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

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

SECTION-II

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

OR

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

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

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

SECTION-III

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

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

OR

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

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

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

SECTION-IV

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

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

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

OR

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

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

SECTION-V

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

b) Explain pointer with arrays. [4M]

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

OR

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

b) Compare structure and union and write a program on each of them. [8M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

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

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

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

SECTION-I

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

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

OR

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

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

SECTION-II

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

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

OR

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

SECTION-III

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

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

OR

Q. No.6 a) List out different types of storage classes in C with example for each. [8M]

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

SECTION-IV

Q. No.7 a) Define array. Declare an array and initialize it. Write about applications of array. [8M]

b) Write a C program to display the transpose of a matrix. [6M]

OR

Q. No.8 a) Define String. Explain declaration and initialization of strings. [6M]

b) Explain the different String manipulation Functions. [8M]

SECTION-V

Q. No. 9 a) Define a pointer. [2M]

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

c) Explain Pointer with arrays. [8 M]

OR

Q. No. 10 a) Differentiate structure and union with example. [8M]

b) What are bit-fields? Write a program illustrating the usage of bit-fields. [6M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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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

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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

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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]

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

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]

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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]

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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

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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]

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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]

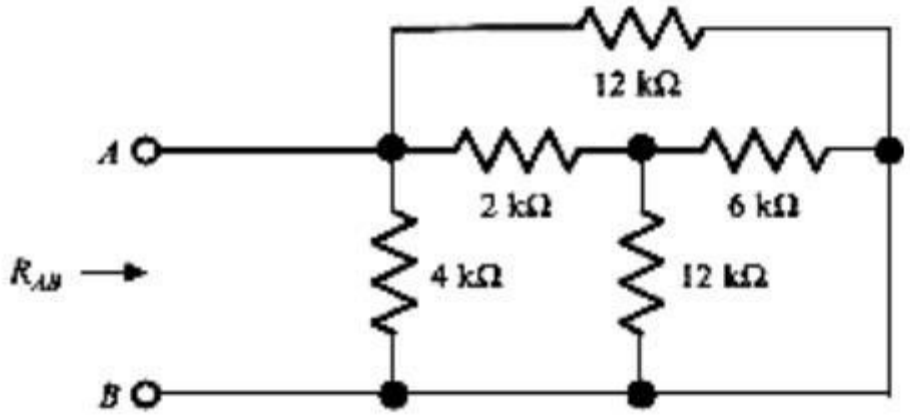


Figure: 1

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]

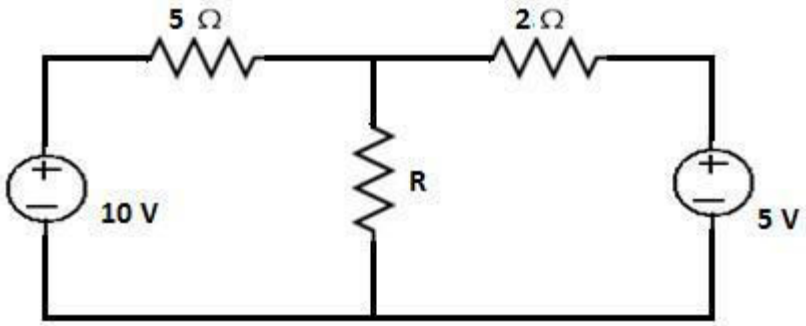
SECTION II

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

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

OR

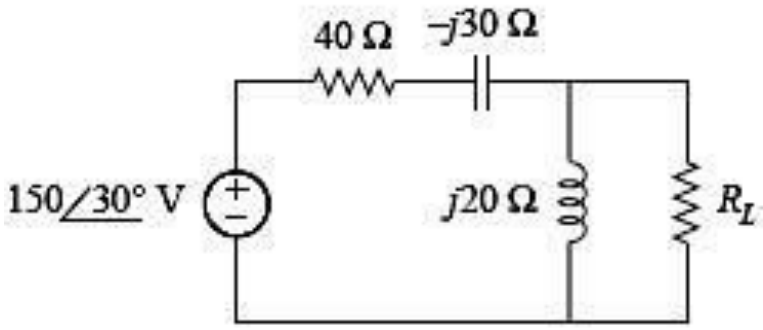
Q.NO: 4 a) Using maximum power transfer theorem, determine the maximum power that is delivered to the unknown resistor R in the circuit below. [7M]



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

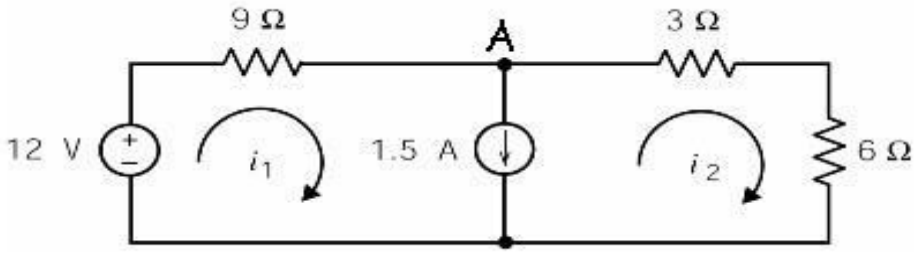
SECTION III

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]

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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

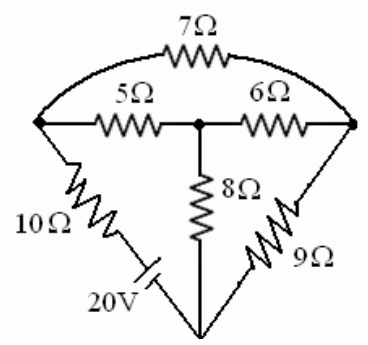
Q.NO: 2 a) Write about source transformation with neat diagrams [7M]

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]

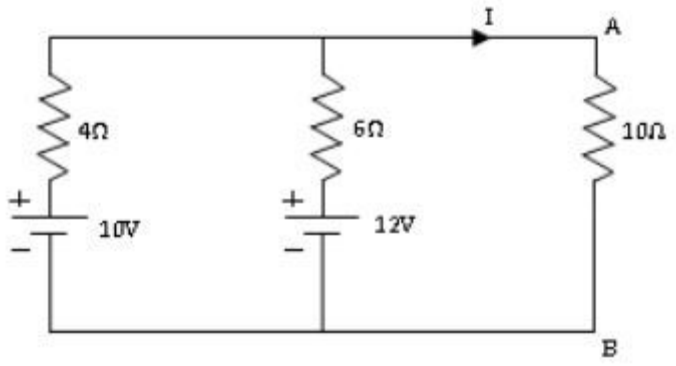
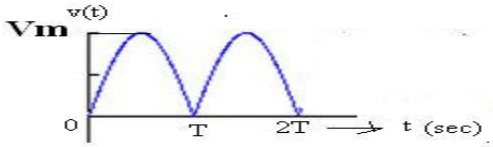


Figure: 1

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]

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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 the various types of network elements [7M]

b) Discuss about the independent and dependent sources with illustrations [7M]

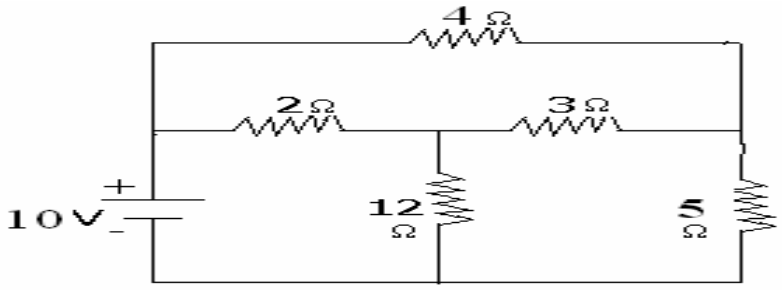
OR

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

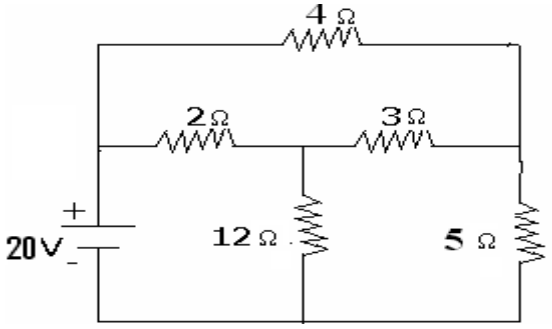
b) Explain about source transformation technique with neat diagrams. [7M]

SECTION II

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



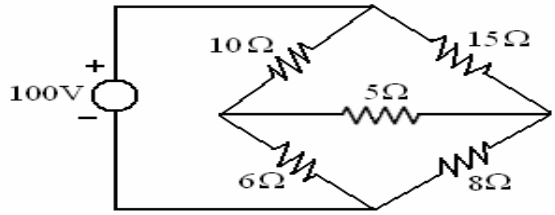
b) Find the current supplied by 10 V battery by using Star – Delta transformation for the following network. [7M]



(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]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year I Semester External Examinations

COMPUTER ORGANIZATION AND ARCHITECTURE

Model Question Paper-1

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

Note: *This question paper consists of 5 Units. Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions*

UNIT-I

1. Define Computer Architecture. Explain the Von Neumann architecture. Compare it with the Harvard architecture**.** (14M)

OR

2. Discuss different Floating Point number representations. Explain the Booths multiplication algorithm with an example**.** (14M)

UNIT-II

3. What is an Addressing Mode? Explain the addressing modes with numerical examples (14M)

OR

4. Explain the Hardwired control unit of the Von Neumann model. What are the basic differences between a Hardwired and Micro Programmed control (14M)

UNIT-III

5. Show by means of a block diagram a 8Mx32 memory using 512kx8 memory chips and Explain the functionality (14M)

OR

6. What do you mean by memory interleaving? Discuss various interleaving techniques (14M)

UNIT-IV

7. a) What is an I/O interface and what are the different functions of I/O interface
   b) What is the basic advantage of interrupt initiated data transfers over transfers Under program control without an interrupt? (7M+7M)

OR

8. Discuss in detail about the isolated I/O and memory mapped I/O (7M+7M)

UNIT-V

9. Explain the 8086 architecture with a neat sketch. Discuss its modes of operation (14M)

OR

10. Define a parallel processor. Explain concurrent memory access techniques in Parallel processors (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year I Semester External Examinations

COMPUTER ORGANIZATION AND ARCHITECTURE

Model Question Paper-2

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

Note: This question paper consists of 5 Units. Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions

UNIT-I

1. Explain the basic functional units of a computer. Write the architectural differences between Von Neumann and Harvard architectures. (14M)

OR

2. Discuss different number representations on a computer. Explain the any division algorithm using restoring techniques (14M)

UNIT-II

3. What is a micro operation? Discuss the role of following processor registers with an examples a) PC b) IR c) AC d) GPR (14M)

OR

4. What do you mean by the Instruction, instruction set, and Instruction cycle of a Computer? Explain the Memory, I/O reference instructions. (14M)

UNIT-III

5. How do you classify semiconductor memories based on their functionality? Explain different semiconductor memories stating their Pros and cons (14M)

OR

6. Write about how the memory in a computer system is organized into a hierarchy? Write short notes on Cache memory (8M+6M)

UNIT-IV

7. a) Write short notes on I/O interface

b) What is an interrupt? Explain how a computer overcomes when an interrupt occurs during I/O processing (5M+9M)

OR

8. What is DMA? Explain the working of DMA stating its merits over the conventional I/O transfer (7M+7M)

UNIT-V

9. Explain the pin diagram of 8086 microprocessor with neat sketch. What are different modes of operating it? (14M)

OR

10. Define a parallel processor. Explain concurrent memory is accessing in Parallel processors (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year I Semester External Examinations
COMPUTER ORGANIZATION AND ARCHITECTURE
Model Question Paper-3

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

Note: This question paper contains consists of 5 Units. Answer any one full question from each unit of these units. Each question carries 14 marks and may have a, b, c as sub questions

UNIT-I

1. a) What is the difference between Computer organization, Computer Architecture, and Computer Design?
   b) Write the architectural and functional differences between Von Neumann and Harvard architectures. (6M + 8M)

OR

2. a) Discuss different number representations on a computer.
   b) Explain integer Addition and Subtraction in Signed magnitude, 2's Complement notations (6M+8M)

UNIT-II

3. What is program status word (PSW) and explain the status bit conditions using your own examples (14M)

OR

4. Define Instruction of a Computer? Explain the instruction execution process using a Memory, I/O reference instructions**.** (14M)

UNIT-III

5. How do you classify semiconductor memories based on their functionality? Explain different semiconductor memories stating their Pros and cons (14M)

OR

6. Write about the following page replacement algorithms a) FCFS b) SJF c) Optimal page replacement (14M)

UNIT-IV

7. a) Explain working of USB device with a neat sketch.
   b) Define an interrupt. What are the types of interrupts? Explain how the interrupts are handled by the CPU. (5M+9M)

OR

8. Compare and contrast between Programmed I/O and Interrupted I/O? Explain about how interrupts change the process state during I/O processing (7M+7M)

UNIT-V

9. What are the major functional units of an 8086 microprocessor? Explain functions of BIU, EU in detailed? (14M)

OR

What is Pipelining? Explain how pipelining improves the speed, throughput , and efficiency of a processor

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year I Semester External Examinations
DATA STRUCTURES
Model Question Paper-1

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

Note: This question paper Consists 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 all asymptotic notations with examples? (7M)
b) What is Linear search? Write a C++ Program to implement Linear search technique? (7M)

OR

Q. No. 2 a) What is Binary search? Write a C++ Program to implement binary search technique? (7M)

b)What is the area of application of Linear and binary search. (7M)

Section-II

Q. No. 3 a) What is a Data structures? Explain various types with example. (7M)

b) Explain Stack data structure with neat diagrams? (7M)

OR

Q. No. 4 a) Explain Queue data structure with neat diagrams? (7M)

b) Write a C++ program for Static implementation of Queue ADT (7M)

Section-III

Q. No. 5 a) What are priority Queues? What are the applications of priority Queue (7M)

b) What is a heap? Explain various types of heaps? (7M)

OR

c) No.6 a) Implement priority Queue using heap (7M)

Explain heap sort with an example. (7M)

Section-IV

b) No. 7 a) Give an ADT for dictionary? (7M)

What are the two methods of representing linear list? Explain with suitable examples? (7M)

OR

Q. No. 8 a) What is double hashing? Compare: Quadratic probing and double hashing (7M)

b) What is rehashing? Explain in detail. (7M)

Section-V

Q. No. 9 a) what is a Binary Search Tree (BST)? Create a BST for the following sequence of numbers: 55, 36, 70, 23, 89, 100, 58, 39, 41, 60, 65, and 25. (7M)

b) Write Pre order, In order and Post order traversal for the above constructed tree?

OR

Q. No. 10 aDefine AVL Tree? Explain the operations on AVL tree with illustrations? (7M)

b) Explain in detail about rotations of AVL tree? . (7M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year I Semester External Examinations

DATA STRUCTURES

Model Question Paper-2

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

****

Section-I

Q. No. 1 **.** Explain the technique of bubble sort. Sort the following elements using bubble sort. 98 ,56 ,12 ,23, 86, 29, 42, 34, 67and write a c++ program to implement bubble sort. (14M)

OR

Q. No.2**.** Explain selection sort ? Sort the following elements using selection sort. 98 ,56 ,12 ,23, 86, 29, 42, 34, 67 and Write a C++ program to implement selection sort. (14M)

Section-II

Q. No. 3 a)What are primitive data types?**.** Explain ADT? (7M)

b) Explain Linear data structures. (7M)

OR

Q. No. 4 Write a C++ program to implement Circular linked list ADT. (14M)

Section-III

Q. No. 5. What is an external sort? Explain external sorting model**.** (14M)

OR

Q. No. 6.Construct Max heap and Min heap for the following instance: 12,5,65,2,33,24,89,23,25,15,17,38,48,23. (14M)

Section-IV

Q. No. 7 What is a skip list? Give its representation and write various operations that can be performed on skip list in detail (14M)

OR

Q. No. 8 What is Dictionary? Write C++ code for implementation of Dictionary with Single linked list(14M)

Section-V

Q. No. 9 What is a balanced tree? Give various types of balance trees. Discuss in detail (14 M)

OR

Q. No. 10 . What is an AVL Tree? Construct an AVL tree for the following elements: 2,10,12,3,35,8,40,5,60,18,7,90,28,93 and then delete 5,18. (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year I Semester External Examinations

DATA STRUCTURES

Model Question Paper-3

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

****

Section-I

Q. No. 1 **.** Explain insertion sort ? Sort the following elements using Insertion sort. 98 ,56 ,12 ,23, 86, 29, 42, 34, 67 Write a C++ program to implement insertion sort (14M)

OR

Q. No.2**.** Explain Merge sort ? Sort the following elements using Merge sort. 45 ,23 ,20 ,50, 70, 24, 33, 43, 47 Write a C++ program to implement Merge sort **.** (14M)

Section-II

Q. No. 3 a) What is a linked list? what are various types of linked lists? (7M)

b) Explain various operations on single linked list. Explain each with a neat sketch (7M)

OR

Q. No. 4 Write a C++ program to implement Doubly linked list ADT(14M)

Section-III

Q. No. 5. What is an external sort? Explain how Quick sort can be realized as external sorting technique, illustrate with an example.(14M)

OR

Q. No. 6.Compare and Contrast all external sorting techniques and give applications of each of them. (14M)

Section-IV

Q. No. 7 a) Explain the ways of implementing dictionaries and give applications of dictionaries**.** (14M)

OR

Q. No. 8 What is a collision? What are various collision resolution techniques and Give the characteristics of Good hashing function (14M)

Section-V

Q. No. 9 . What is a B-Tree? Construct a B-tree of order 3 for the following elements:
25,10,20,30,35,80,40,50,60,82,70,90,85,93. (14 M)

OR

Q. No. 10 . a) Explain threaded binary trees? (7M)

b) Prove that height of AVL tree with n elements is O(log(n)). (7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B.Tech II Year I Semester External Examinations
OPERATING SYSTEMS
MODEL QUESTION PAPER - 1

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) What is a system call? Explain different types of system calls.

OR

2) What is operating system? Give the view of OS as a resource manager

SECTION – II

3) Explain about various multithreading models and Thread libraries.

OR

4) What is FCFS Scheduling algorithm? Explain SJF Algorithm with a neat gantt chart.

SECTION – III

5) What is Semaphore? Discuss in detail about the classical problems of synchronization.

OR

6) Describe in detail about the deadlock prevention methods.

SECTION – IV

7) Explain in detail about the structure of the page table.

OR

8) What is Copy on Write? Describe in detail about memory mapped Files.

SECTION – V

9) Explain the concept of FCFS, SSTF disk scheduling algorithms in detail.

OR

10) Describe in detail about the file system implementation.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B.Tech II Year I Semester External Examinations
OPERATING SYSTEMS
MODEL QUESTION PAPER - 2

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) Describe in detail about the OS Services.

OR

2) What is the concept of virtual machine and illustrate it with UNIX as case study.

SECTION – II

3) Define Process. Discuss in detail about PCB and context switching in the states of process.

OR

4) What is Scheduling? Explain in detail about the Real Time Scheduling.

SECTION – III

5) What is Critical section Problem and list the requirements to solve it. Write Peterson's Solution for the same.

OR

6) What is deadlock? List the conditions that lead to deadlock. Enumerate and explain in detail about the methods for handling deadlock.

SECTION – IV

7) Write Short notes on: 1. Address Binding 2. Logical versus Physical Address Space 3. Swapping 4. Dynamic linking and Shared Libraries

OR

8) Define demand paging? Explain in detail about the concept and performance of demand paging.

SECTION – V

9) Describe in detail about the polling, interrupts and DMA with respect to I/O hardware.

OR

10) Explain various methods of of allocating disk space to the files

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B.Tech II Year I Semester External Examinations
OPERATING SYSTEMS
MODEL QUESTION PAPER - 3

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) Discuss about the various generation and types of Operating systems

OR

2) How is layered operating system structured? Compare and contrast on Monolithic and microkernel operating systems

SECTION – II

3) Describe the various states of Threads in detail.

OR

4) What is a scheduling objective? Describe the pre-emptive and non-preemptive scheduling algorithms with an illustrative example.

SECTION – III

5) Define Racing Condition. Describe a hardware solution to avoid racing condition.

OR

6) Enumerate the necessary and sufficient conditions for the deadlock and describe the Banking Algorithm.

SECTION – IV

7) Define Paging. Describe the principle of operation of paging in detail.

OR

8) Consider the page reference string 1,3,4,0,5,3,2,1,0,4,5,2.How many page faults occur for the LRU and Optimal replacement algorithms with 4 frames each ?

SECTION – V

9) Explain the different file access methods.

OR

10) Describe the scheduling methods a. FCFS b. C-SCAN

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year I Semester External Examinations

DISCRETE MATHEMATICS

MODEL QUESTION PAPER - 1

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

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) Show that ~p follows from the set of premises (r→~q),rVs,s→~q, p→q using indirect method of proof (14M)

OR

2) Prove that the following argument is Valid (14M)

$\forall x, [P(x) \vee Q(x)]$
$\exists x, \sim P(x)$
$\forall x, [\sim Q(x) \vee R(x)]$
$\forall x, [S(x) \rightarrow \sim R(x)]$
_____
$\exists x, \sim S(x)$

SECTION – II

3) a)Verify the following relation R on X = {1, 2, 3, 4} is equivalence relation or not explain?
R={(1,1),(1,4),(4,1),(2,2),(2,3),(3,4),(3,3),(3,2),(4,3),(4,4)} (7M)

b) Let f(x) = x+2, g(x)= x-2, h(x)=3x for all x where R is set of Real Numbers then find gOf, fOg, hOf, fO(gOh). (7M)

OR

4). Define Poset and Verify X is a Poset or not for X={2,3,6,24,36,48} and relation ≤ be such that x≤y, if x divides y. (14M)

SECTION – III

5) Find all the properties that satisfies for the following algebraic systems under the binary operations 'X' and '+'. (a) Odd integer (b) All positive integers) (14M)

OR

6). Define a semi group and Monoid. Give an example of a Monoid which is not group. Justify your answer (14M)

SECTION – IV

7). a)Illustrate pigeon hole principle and its applications (7M)

b)How many ways can the letters of the word ALGORITHM be arranged in a row if A and L must remain together as a unit? (7M)

OR

8).a) In how many ways can 23 different books be given to 5 students so that 2 of the students will have books each and other 3 will have 5 books each. (7M)

b)How many different 8-digit numbers can be formed by arranging the digits 1,1,1,1,1,2,3,3,3. **(7M)**

SECTION – V

9). (a) Define Cycle? (3M)

(b) Apply DFS algorithm to form the spanning tree by taking own graph. (11M)

OR

10) Explain the following (14M)

(a) Isomorphism and sub graphs

(b) Hamilton Paths

(c) Planar Graph

(d) Perfect Graph

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year I Semester External Examinations

DISCRETE MATHEMATICS

MODEL QUESTION PAPER - 2

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) State and explain the rules that that can generate a well formed formula (14M)

OR

2). Obtain POS of the following formulas (14M)

(i) (P ΛQ ΛR) V (~P ΛRΛQ) V(~P Λ~Q Λ~R) (ii) PV(~P→(QV(~Q→R)))

SECTION – II

3) Let A= {2,4,6,8,10,12}, show that the relation 'divides' is a partial ordering on A. (14M)

OR

4). Define Poset and Verify X is a Poset or not for X={2,3,6,24,36,48} and relation ≤ be such that x≤y, if x divides y. (14M)

SECTION – III

5) Define the following terms (i) Group (ii) Abelian Group (iii) Semi Group (iv) Sub Group(14M)

OR

6). Let G= {-1, 0, 1}, verify whether G forms a group under usual addition (14M)

SECTION – IV

7 a) Find the number of non negative integral solutions to X1+X2+X3+X4+X5=10 (**7M)**

b) Find the number of arrangements of letters "MISSISSIPPI". (7M)

OR

8). a) In how many ways can 44 different books be given to 6 students so that 3 of the students will have books each and other 3 will have 5 books each. (7M)

b)Use the principle of inclusion-exclusion to determine the number of prime integers less than 400. (7M)

SECTION – V

9). Find the Chromatic number of the following graphs (14M)

(a) Complete Graph (K3)

(b) Complete Bipartite Graph (K2,3)

(c) Regular Graphs (K3)

OR

10) Explain and illustrate BFS and DFS with examples? (14M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B.Tech II Year I Semester External Examinations
DISCRETE MATHEMATICS
MODEL QUESTION PAPER – 3

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) a)Define PDNF and find PDNF for $(\sim P \leftrightarrow R)$ $(Q \leftrightarrow P)$. (7M)

b). Explain any five rules of inference with examples . (7M)

OR

2). Show that ~p follows from the set of premises (r→~q),rVs,s→~q, p→q using Direct method of proof (14M)

SECTION – II

3) Define Poset. Let A= {2,4,6,8,10,12}, show that the relation 'divides' is a partial ordering on A. (14M)

OR

4). Define Equivalence Relation and Verify X is a Poset or not for X={2,3,6,24,36,48} and relation ≤ be such that x≤y, if x divides y. (14M)

SECTION – III

5 a). Let G= {-1, 0, 1}, verify whether G forms a group under usual addition. (7M)

b). Define the following terms (i) Group (ii) Abelian Group (iii) Ring (7M)

OR

6). Let G= {-1, 0, 1}, verify whether G forms a group under usual addition (14M)

SECTION – IV

7 a) Find the number of non negative integral solutions to X1+X2+X3+X4+X5=10 (7M)

b) Find the number of arrangements of letters "MISSISSIPPI". (7M)

OR

8). a) In how many ways can 44 different books be given to 6 students so that 3 of the students will have books each and other 3 will have 5 books each. (7M)

b)Suppose that we have a 15-letter alphabet. How many 6-letter words have exactly 3 consecutive letters the same? (7M)

SECTION – V

9). a). Write Kruskal's Algorithm and explain it with an example. (7M)

b). Prove that complete graph of 5 vertices is non planar. (**7M)**

OR

10).i) Find the Chromatic number of the following graphs (7M)

(a) Complete Graph (K3)

(b) Complete Bipartite Graph (K2,3)

(c) Regular Graphs (K3)

ii) Explain DFS with examples? (7M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year I Semester External Examinations

Probability and Statistics

MODEL QUESTION PAPER-1

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) A random variable has the following probability function

x	0	1	2	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K^2	$2K^2$	$7K^2+K$

Find i)k ii)P(X≤6) iii) P(X>6) iv)) find'c' if P(X≤c)>1/2 [7M]

b) A sample if 4 items is selected at random from a box containing 12 items of which 5 are defective. Find the expected number E of defective items. [7M]

OR

2) For the following bivariate (two dimensional) probability distribution of X and Y find i) P (X≤ 2,Y=2) ii) $F_X(2)$ iii) P(Y=3) iv) P(X<3,Y≤ 4) v) $F_Y(3)$ [14M]

X/Y	1	2	3	4
1	0.1	0	0.2	0.1
2	0.05	0.12	0.08	0.01
3	0.1	0.05	0.1	0.09

SECTION-II

3) The average number of phone calls /minute coming into a switch board between 2pm and 4pm is 2.5.Determine the probability the probability that one particular minute there will be i) 4 or fewer ii) more than 6 calls [14M]

OR

4) Suppose the weights of 800 male students are normally distributed with 28.8kg and SD of 2.06 kg. Find the number of students whose weights are
i) Between 28.4 kg and 30.4kg ii) more than 31.3 kg [14M]

SECTION-III

5a) Find the Karl-Pearson's coefficient of correlation for the paired data: [7M]

wages	100	101	102	100	99	97	98	96	95	102
Cost of living	98	99	99	95	92	95	94	90	91	97

b) If θ is the angle between two regression lines and S.D of Y is twice the S.D of X and r =1.25, find $\tan\theta$. [7M]

OR

6) The heights of mothers and daughters are given in the following table. From the two tables of regression estimate average height of daughter when the height of the mother is 64.5 inches

Height of mother	62	63	64	64	65	66	68	70
Height of daughter	64	65	61	69	67	68	71	65

SECTION-IV

7a) A sample of size 64 and mean70 were taken from a population whose standard deviation is 10.Construct 95% confidence interval for the mean. [7M]

b) Write about (i) Null hypothesis (ii) Type I and Type II errors (iii) Alternative hypothesis. [7M]

OR

8a) In a study of automobile insurance a random sample of 80 body repair costs had a mean of Rs.472.36 and S.D of Rs.62.35. If x is used as point estimate to the true average repair costs, with what confidence we can assert that the maximum error doesn't exceed Rs.10 [7M]

b) Explain the procedure for Testing of Hypothesis. [7M]

SECTION-V

9) A survey of 320 families with 4children each revealed the following distribution. [14M]

No# of boys	5	4	3	2	1	0
No# of girls	0	1	2	3	4	5
No# of families	14	56	110	88	40	12

Is this result consistent with the hypothesis that male and female births are equally popular?

OR

10) The following are the average weekly losses of worker hours due to accidents in 10 industrial plants before and after a certain safety programme was put into operation:

Before	45	73	46	124	33	57	83	34	26	17
After	36	60	44	119	35	51	77	29	24	11

Test whether the safety programme is effective in reducing the number of accidents at 5%LOS. [14M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year I Semester External Examinations
Probability and Statistics
MODEL QUESTION PAPER-2

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

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

SECTION-I

1 a) If the p.d.f of a r.v x is given by $f(x) = \begin{cases} k(1-x^2), & 0 < x < 1 \\ 0, & otherwise \end{cases}$

find i) k and ii) the cumulative distribution function of x. [7M]

b)Write the definitions of (i)Random variable (ii)Discrete random variable (iii) Continuous random variable and (iv)Probability Distribution function. [7M]

OR

2) A random sample with replacement of size 2 is taken from S = {1,2,3}. Let the random variable X denote the sum of the two numbers taken: (i) Write the probability distribution of X

(ii) Find the mean

(iii) Find the variance. [14M]

SECTION-II

3. A sales tax officer has reported that the average sales of the 500 businesses that he has to deal with during a year is Rs.36,000 with a standard deviation of Rs.10,000. Assuming that the sales in these businesses are normally distributed ,find :

i) The number of business as the sales of which are greater than Rs.40,000

ii) The percentage of business sales of which are likely to range between Rs.30,000 and Rs.40,000 [14M]

OR

4. If 2% of light bulbs are defective, find

(i) atleast one is defective

(ii) exactly 7 are defective

(iii) p(1<x<8) in a sample of 100

(iv) atmost one is defective [14M]

SECTION-III

5 a) Fit a straight line Y=a_0+a_1X for the following data and estimate the value of Y when X = *25*

X	0	5	10	15	20
Y	7	11	16	20	26

[7M]

b) Show that the maximum value of rank correlation coefficient is 1 [7M]

OR

6a) The marks obtained by 10 students in mathematics and statistics are given below. Find the rank correlation coefficient between the two subjects

Marks in mathematics	25	28	30	32	35	36	38	42	45	39
Marks in Statistics	20	26	29	30	25	18	26	35	46	35

[7M]

b) Find the Correlation coefficient if b_{xy} = 0.85 , b_{yx} = 0.89. [7M]

SECTION-IV

7.a) Samples of size 2 are taken from the population 1,2,3,4,5,6 with replacement. Find

(i) The mean of the population

(ii) Standard deviation of population

(iii) The mean of the sampling distribution of means

(iv) The standard deviation of the sampling distribution of means [12M]

b) What is a statistic? Give an example [2M]

OR

8. a) Write about null hypothesis and testing of null hypothesis. [4M]

b) 20 people were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate if attacked by this disease is 85% in favour of the hypothesis that is more at 5% level. [10M]

SECTION-V

9. In an investigation on the machine performance the following results are obtained:

	No# of units inspected	No# of defectives
Machine 1	375	17
Machine 2	450	22

Test whether there is any significant performance of two machines at 5%LOS [14M]

OR

10. The following is the distribution of the daily number power failures reported in a city

No# of power failures	0	1	2	3	4	5	6	7	8	9
No# 0f days	9	43	64	62	42	36	22	14	6	2

Test the goodness of fit of Poisson distribution at 5% LOS [14M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year I Semester External Examinations
Probability and Statistics
MODEL QUESTION PAPER-3

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

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

SECTION-I

1 a) If F(x) is the distribution function of x is given by $F(X) = \begin{cases} 0 & if\ x \le 1 \\ k(x-1)^4 & if\ 1 < x \le 3 \\ 1 & if\ x > 3 \end{cases}$

Determine i) f(x) ii) k iii)mean [10M]

b)Define (i) Probability mass function (ii) Probability density function . [4M]

OR

2 a) Two random variables x and y have the joint density function

$$f_{xy}(x,y) = \begin{cases} x^2 + \frac{xy}{3}, & 0 \le x \le 1, 0 \le y \le 2 \\ 0, & otherwise \end{cases}$$

Show that x and y are not independent . Find the conditional density function . check whether it is valid or not. [7M]

b) The joint density function of w and z is given by

$$f_{wz}(wz) = \begin{cases} bwz, & 1 \le w \le 3,\ 2 \le z \le 4 \\ 0, & otherwise \end{cases}$$

Find b and marginal density function. [7M]

SECTION-II

3a) Average number of accidents on any day on a national highway is 1.8 .Determine the probability that the number of accidents are i) atleast one ii) atmost one iii) exactly one. [7M]

b) Fit a binomial distribution to the following data [7M]

x	0	1	2	3	4	5
f	38	144	342	287	164	25

OR

4) In a normal distribution,7% of the items are under 35 and 89% are under 63.Determine the mean and variance of the distribution. [14M]

SECTION-III

5) Obtain the rank correlation coefficient for the following data [14M]

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	44	81	60	68	48	50	70

OR

6) A panel of two judges P and Q graded seven dramatic performances by independently awarding marks as follows:

Performance	1	2	3	4	5	6	7
Marks by P	46	42	44	40	43	41	45
Marks by Q	40	38	36	35	39	37	41

The eight performance, which judge Q would not attend, was awarded 37 marks by judge P. If judge Q had also been present, how many marks would be expected to have been awarded by him to the eighth performance. [14M]

SECTION-IV

7a) A population consists of 5,10,14,18,13,24.Consider all possible samples of size 2 which can be drawn without replacement from the population. Find

i)The mean of the population

ii) Standard deviation of the population

iii) The mean of the sampling distribution of means

iv) Standard deviation of the sampling distribution of means [10M]

b) Write short notes on Type I and Type II error. [4M]

OR

8 a) A random sample of size 16 values from a normal population showed a mean of 53 and a sum of squares of deviations from the mean equals to 150. Can this sample be regarded as taken from the population having 56 as mean ? Obtain 95% confidence limits of the mean of the population . [10M]

b) Write step procedure for difference of means of two independent samples. [4M]

SECTION-V

9 a) Explain χ^2 test for independence of attributes. [4M]

b) The measurements of the output of two units have given the following results. Assuming that both Samples have been obtained from the normal distribution at 10% LOS. Test whether the two Populations have the same variance.

Unit –A	14.1	10.1	14.7	13.7	14.0
Unit -B	14.0	14.5	13.7	12.7	14.1

[10M]

OR

10) The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70,64,64,66 inches . Is it reasonable to believe that the average height is greater than 64 inches .Test at 5% LOS. [14M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-I
ANALOG & DIGITAL ELECTRONICS

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

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

SECTION-I

1)

(a) Explain V-I characteristics of pn junction Diode. [7]

(b) Explain the effect of temperature on V-I characteristics of a diode. [7]

OR

2) Explain the constructional and principal operations of SCR and PHOTO diode. [14]

SECTION-II

3) (a) Explain different current components in a transistor. [7]

(b) Explain how Transistor acts as an Amplifier [7]

OR

4) **(a)** Draw the circuit diagram of a transistor in CB configuration and explain the output Characteristics with the help of different regions. [7]

(b) Calculate the collector current and emitter current for a transistor with α D.C. = 0.99 and I ICBO = 50 μA when the base current is 20μA. [7]

SECTION-III

5) Convert the following

(i) $(100010.10)_2$ --------→ ($)_{10}$ (ii) $(147.12)_8$-----→ ($)_2$

(iii) $(ABC.12)_{16}$----------→ ($)_2$ (iv) $(126.12)_8$ ---→ ($)_{16}$ [7]

(b) Expand A+BC'+ABD'+ABCD [7]

OR

6) Explain the different Logic gates with truth tables [14]

SECTION-IV

7) Simplify the following Boolean function using K Maps

a) F(a,b,c,d)= Σm(0,1,5,7,9,12,15)+d(2,3,10) [7]

b) F(a,b,c,d)= ΠM(3,5,9,11,15)+d(2,4,10) [7]

OR

8) (a) Reliaze the Half adder circuit using NAND Gates [7]

(b) Implement f(a.b.c) = Σm(0,1,5,7,9,12) using NOR gates [7]

SECTION-V

9) Explain how you design a combinational circuit. Show a combinational circuit for a Binary Multiplier [14]

OR

10) Design a combinational circuit of a magnitude comparator considering one example [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-II
ANALOG & DIGITAL ELECTRONICS

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

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

SECTION-I

1) Explain the working of Tunnel diode with help of energy band diagrams and Draw V-I Characteristics [14]

OR

2) (a) Explain the construction and working principal of photo diode. [7]
(b) Draw the equivalent circuits of diode [7]

SECTION-II

3) (a) Summarize the salient features of the characteristics of BJT operatives in CE, CB and CC Configurations? [7]
(b)Calculate the collector current and emitter current for a transistor with αD.C. = 0.99 and

ICBO = 20μA when the base current is 50μ A.
[7]

OR

4) (a) Draw the circuit diagram of a transistor in CB configuration and explain the output characteristics with the help of different regions. [7]
(b) In a germanium transistor collector current is 51mA, when base current is 0.4mA. If hfe = β dc = 125, Calculate cut off current, ICEO [7]

SECTION-III

5) (a) What is the gray code equivalent of the Hex Number 3A7 [2]
(b) Find 9's complement of $(25.63\ 9)_{10}$ [3]
(c) Convert the following to minterm A+B'C' [2]
(d) what is Number system explain in detail?
[7]

OR

6) Simplify to a sum of 3 terms:
a) A'C'D' +AC' +BCD + A'CD' + A'BC + AB'C' [7]
b) Given AB' + AB = C, Show that AC' + A'C = B [7]

SECTION-IV

7) Explain how you convert sum of the products into product of sums. Give with example. Also minimize the following function. F= (0, 2, 4, 8, 9, 12, 14). Show the gating circuit after minimization [14]

OR

8) Using the maps method, simplify the following expression using sum of the product from.
a) (abc)'+a(bc)' +don't cares abc+a'bc'+a'b'c
[7]
b) abc+(ab)'c +don't cares abc'+ab'c [7]

SECTION-V

9) Explain the Analysis and design procedure for a combinational circuit. Also design a binary multiplier [14]

OR

10) Define flip flop? Explain about Different types of flip flops in detail? [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
B.Tech II year – I Semester Examinations, Model Paper-III
ANALOG & DIGITAL ELECTRONICS

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

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

SECTION-I

1) Explain the operation of PN Junction Diode with neat diagrams? [14]

OR

2) (a) Explain about Zener Diode characteristics [7]
(b) Explain about various special purpose diodes [7]

SECTION-II

3) (a) How the Transistor acts as an amplifier. [7]
(b) Explain different current components in a transistor. [7]

OR

4) (a) Compare the three transistor amplifier configurations with related to A_i,Av,R_i& R_O [7]
(b) Draw the circuit diagram of a transistor in CB configuration and explain the output characteristics with the help of different regions. [7]

SECTION-III

5) Convert the following numbers:
a) 10101100111.0101 to Base 10 [2]
b) $(153.513)_{10}$ = ( )$_8$ [2]
c) Explain the Properties of X-OR Gate [5]
d) Explain the properties of Boolean Algebra [5]

OR

6) (a) Explain the importance of gray code and Construct 4 bit gray code [7]
(b) Simplify and Implement the following function using Logic gates
A'BC+A'B'C+ABC'+AB'C+A'BC' [7]

SECTION-IV

7) Reduce the following expression using K-Map and implement using Logic gates .
F= (a+b').(cd+e') [14]

OR

8) (a) Implement Half adder using 4 NAND gates [7]
(b) Implement full subtrctor using NAND gates only. [7]

SECTION-V

9) (a) Design a 8:1 multiplexer using 4:1 Multiplexer [7]
(b)Design a 2 bit Magnitude comparator [7]

OR

10) (a) Convert JK flip flop to SR flip flop [14]
(b) Explain about all flip flops [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
SOFTWARE ENGINEERING
MODEL QUESTION PAPER-1

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) What is a software process? Explain in detail about the generic process model. (14M)

OR

2) "A well-designed agile process "flattens" the cost of change curve, allowing a software team to accommodate changes late in a software project without dramatic cost and time impact". Support this statement with the detail explanation on Agile Process. (14M)

SECTION – II

3) State and explain in detail about Requirements Engineering. (14M)

OR

4) Enumerate the general rules of creating the analysis model and Explain about the Domain Analysis. (14M)

SECTION – III

5) List the software quality guidelines for design representation and explain about design concepts. (14M)

OR

6) Explain about the various stages of object oriented design process. (14M)

SECTION – IV

7) Describe the test strategies of Object oriented software in comparision with the conventional software. (14M)

OR

8) Explain the metrics for the Requirements model. (14M)

SECTION – V

9) Enumerate the categories of software risk and explain how risks are identified and estimate the risk. (14M)

OR

10) What are the elements of software quality Assurance? Discuss in detail about statistical software quality Assurance. (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
SOFTWARE ENGINEERING
MODEL QUESTION PAPER-2

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) Define Software Engineering. Explain in detail about software engineering practices. (14M)

OR

2) "The best software process is one that is close to the people who will be doing the work". Support this statement and explain about personal and team process Models. (14M)

SECTION – II

3) Describe in detail about the software system requirements. (14M)

OR

4) What is UML? Explain in detail about the UML graphical model. (14M)

SECTION – III

5) Discuss about the taxonomy of architecture styles. (14M)

OR

6) What is Interface Analysis? Enumerate the interface design steps and explain. (14M)

SECTION – IV

7) What is Verification and Validation? Explain the strategic approaches to software testing. (14M)

OR

8) Explain about the direct and indirect measures of software measurement. (14M)

SECTION – V

9) Describe in detail about the Risk Mitigation, Monitoring and Management. (14M)

OR

10) "A formal technical review (FTR) is a software quality control activity performed by software engineers". Explain. (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
SOFTWARE ENGINEERING
MODEL QUESTION PAPER-3

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1) Enumerate the unique nature of WebApps and discuss about the software myths in detail. (14M)

OR

2) Discuss about the use of Extreme Programming (XP) in the Agility Modeling. (14M)

SECTION – II

3) "Four high-level requirements engineering sub-processes are concerned with assessing whether the system is useful to the business (feasibility study); discovering requirements (elicitation and analysis);".Explain. (14M)

OR

4) Write short notes on a) Data Models b) Object Models (14M)

SECTION – III

5) What is process dimension and abstraction dimension? Explain Design Model in detail. (14M)

OR

6) Enumerate the Theo Mandel's three golden rules on interface design and explain on design evaluation. (14M)

SECTION – IV

7) Describe in detail about the system testing and debugging. (14M)

OR

8) Explain about the metrics for software quality and integrating metrics with software process. (14M)

SECTION – V

9) Explain about the Risk Mitigation, Monitoring and Management. (14M)

OR

10) Discuss the process improvement framework CMMI in detail. (14M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
FORMAL LANGUAGES AND AUTOMATA THEORY
MODEL QUESTION PAPER-1

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

Note: This question paper consists of 5 Units. Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions

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SECTION – I

1).a) Construct DFA and NFA accepting the set of all strings containing 010 as a substring. (7M)

b) Define the terms alphabet, string, prefix, suffix, language give examples (7M)

(OR)

2). a) Define NFA with epsilon with an example. Design NFA to accept identifiers of C language

b) Define regular grammar give examples (7M +7M)

SECTION – II

3). Write regular expressions for each of the following languages over an alphabet {0, 1}

a) The set of all strings not containing "111" b) The set of all strings in which every pair of adjacent 0's appears before any pair of adjacent 1's (7M+7M)

(OR)

4). a) Prove pumping lemma of regular sets? (7M)

b) Consider the following grammar G=({S,A}{a,b},P,S) (7M)

Where P consists of

S→aAS/a

A→SbA/SS/ba

SECTION – III

5).a). Consider the following grammar G=({S,A}{a,b},P,S) (10M)

Where P consists of S→aAS/a

A→SbA/SS/ba

for the string aabbaa show i)Left most derivation ii).Right most derivation

b). Define CFG .Write CFG to generate palindromes over {a,b} and state its advantages (4M)

(OR)

6).a) What is meant by ambiguous grammar? Test whether the grammar is ambiguous or not.

$S \rightarrow A \mid B$

$A \rightarrow aAb \mid ab$

$B \rightarrow abB \mid \epsilon$ (12M)

b) Define Chomsky Normal Form (2M)

SECTION – IV

7).a) Design LBA to accept all strings generated by the language $\{a^n b^m a^n \mid m, n \geq 1\}$ (8M)

b) Define Turing decidable, Recognizable, and Undecidable languages and give example. (6M)

(OR)

8)a) Explain the equivalence of CFL and PDA. (4M)

b) Construct the given right linear grammar into equivalent left linear grammar S→bB; B→bC; B→aB; C→a; B→b (10M)

SECTION – V

9). List out different variants of a TM? How TM performs complex tasks? Explain (14M)

(OR)

10). Design Turing Machine to increment the value of any binary number by one. The output should also be a binary number with value one more the number given. (14M)

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
FORMAL LANGUAGES AND AUTOMATA THEORY
MODEL QUESTION PAPER-2

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

Note: This question paper consists of 5 Units. Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions

******

SECTION – I

1.a) What is a finite automaton(DFA)? Design a DFA for the following language

$L = \{ 0^m 1^n \mid m \geq 0 \text{ and } n \geq 1\}$ (7M)

b). Give English description of the language: b(a*b)*a* (7M)

OR

2). a).Find DFA equal to NFA described by the following state transition table. Initial state =p, final states are {q,s} (10M)

States	0	1
p	q,s	q
q	r	q,r
r	s	p
s	-	p

b). Define a right linear grammar and give an example (4M)

SECTION – II

3).a) Convert the following regular expression into equivalent NFA with ε-transitions

R=(10*)* 11 (5M)

b) Construct a transition system corresponding to the regular expression (a+b)*abb find its equivalent DFA (9M)

OR

4).a) Convert the R.E. = ab(a|b)* into DFA (10)

b) Explain about closure properties of Regular languages (4M)

SECTION – III

5.a) Construct CFG to define the language L={$a^n b^n$ / n greater than or equal to 0} (8M)

b) Explain about Pumping lemma for CFLs (6M)

OR

6). Is the following grammar ambiguous? Construct the left-most and right-most derivations and parse trees for the following grammar

S → aB | bA

A → aS | bAA | a

B → bS | aBB | b which accepts the string "aaabbabbba". (14M)

SECTION – IV

7. a) Construct LBA to accept the language L={ww^R / w is a string of 0's and 1's w^R is the reverse of w } (9M)

b) Explain about Chomsky hierarchy of languages (5M)

OR

8.) Explain the elements of a Turing machine™? Define Instantaneous Description(ID), Language accepted by a TM using your own examples. (14M)

SECTION – V

9). a) State and explain Church-Turing hypothesis. (6M)

b) Explain the Universal Turing machines (7M)

(OR)

10). a) Explain about Decision properties of DCFL's. (7M)

b) State Rice's Theorem and explain? (7M)

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
FORMAL LANGUAGES AND AUTOMATA THEORY
MODEL QUESTION PAPER-3

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

Note: This question paper consists of 5 Units. Answer any one full question from each unit. Each question carries 14 marks and may have a, b, c as sub questions

SECTION – I

1.a) Convert the following NFA to DFA (7M)

∂	0	1
→q0	{q1 q2}	{q0}
q1	{q1,q2}	Φ
*q2	{q1}	{q1 ,q2}

b). Give English description of the language: b(a*b)*a* (7M)

OR

2). a) Construct a Moore machine equivalent to the following Mealy machine (10M)

Current state	A=0		A=1	
	Next state	Output	Next state	output
→q1	q3	0	q2	0
q2	q1	1	q4	0
q3	q2	1	q1	1
q4	q4	1	q3	0

b). Define a left linear grammar with an example (4M)

SECTION – II

3).a) Explain about closure properties of Regular languages (4M)

b) Construct a transition system corresponding to the regular expression

a) (ab+a)*(ab+b) b) a*b+b*a (10M)

(OR)

4).a) Find a DFA that accepts the language of the regular expression $(a|b)^*aba$ (8M) b). Use pumping lemma to prove that L ={a^nb^n }is not regular (6M)

SECTION – III

5.a) State CNF. Is the following in CNF? If not, convert it into CNF E→E+T/T, T→T*F/F, F→(E)/a.

b) Remove left recursion (if any) from the resultant grammar (8M+6M)

(OR)

6). Explain the PDA? Define ID, Language of a PDA M. Explain Acceptance by final state and Empty stack (14M)

SECTION – IV

7. Explain the steps in conversion of a PDA to its equivalent CFG. Use the method to convert the below PDA transitions into equivalent CFG production rules. (14M)

$\delta(q_0, a, Z) = (q_0, AZ)$

$\delta(q_0, a, A) = (q_0, A)$

$\delta(q_0, b, A) = (q_1, \varepsilon)$

$\delta(q_1, \varepsilon, Z) = (q_2, \varepsilon)$

(OR)

8. What is the language of a Linear Bounded Automata(LBA). Design a LBA for the language L= {WcW^R / W ∈ (0+1)*} over the alphabet Σ={0, 1} (14M)

SECTION – V

9). a) Explain about Chomsky hierarchy of languages. (7M)

b) Design a Turing machine to add two numbers. (7M)

(OR)

10).a) Write short notes on Universal Turing Machine (7M)

b) What are the undecidable problems in formal languages? (7M)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
JAVA PROGRAMMING
MODEL QUESTION PAPER-1

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

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question From each SECTION and each Question carries 14 marks.

SECTION – I

1. (a) Discuss OOP concepts in detail.

(OR)

2. (a) Describe about Type conversion.
(b) Also explain how casting is used to perform type conversion between incompatible types.

SECTION – II

3. (a) What is inheritance? Give an example.
(b) What is meant by Dynamic Binding? Explain.

(OR)

4. How a method can be overridden? Explain.

SECTION – III

5. (a)Give the class hierarchy in Java related to exception handling.
(b)Briefly explain each class.

(OR)

6. (a)What is a thread?
(b) Explain the states of a thread with anExample.

SECTION – IV

7. Explain in detail about collection interfaces.

(OR)

8. Explain in details about binary input and output operations.

SECTION – V

9. Explain in detail about the classification of swing components.

(OR)

10. Explain in brief about events and event sources.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
JAVA PROGRAMMING
MODEL QUESTION PAPER-2

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

Note:
Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. Explain (a) Datatypes (b) Variables (c) Constants (d) Type-casting

(OR)

2. What is a method? How a method is used in the class? Explain.

SECTION – II

3. Explain the usage of Abstract classes and methods.

(OR)

4. Discuss how inheritances are defined and implemented.

SECTION – III

5. (a)Does Java support Exception Handling? Explain.

(OR)

6. What is synchronization? Explain with suitable example.

SECTION – IV

7. (a)Write short notes on the following collection frame work classes.

a. Random 2) Scanner

(OR)

8. Write short notes on:
1) Connection interface 2) Statement object 3) Inner join 4) Execute Query Method.

SECTION – V

9. Write a short-note on Layout Manager types supported by Java.

(OR)

10. Write the difference between applets and applications.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
JAVA PROGRAMMING
MODEL QUESTION PAPER-3

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

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. List the primitive data types of java. Explain each of them in detail.

(OR)

2. What are the different types of array? List out the advantages of using arrays?

SECTION –II

3. Write in detail about the packages.

(OR)

4. Write the differences between interfaces and abstract classes.

SECTION – III

5. (a) What are the checked Exceptions and Unchecked Exceptions?
(b) Explain these exceptions with an example and also give the difference between them.

(OR)

6. Is it possible to interrupt a thread? Explain.

SECTION – IV

7. Explain in detail about hash table class.

(OR)

8. Explain in detail about the types of drivers in JDBC.

SECTION – V

9. Discuss in detail about swing components.

(OR)

10. Explain about various event classes.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
DATABASE MANAGEMENT SYSTEMS
MODEL QUESTION PAPER-1

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

Note:
Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

1. Draw and Explain the Database Architecture?

OR

2. Draw the ER Diagram for University Database.

3. Explain the following with examples.

a) Key constraints. b) Foreign key constraints. c) General Constraints

OR

4. What is a view? Explain about views in detail?

5. Explain the following

a) Lossless Join b) Lossless decomposition c) Join Dependency.

OR

6. a) What are the advantages of normalized relations over the unnormalized relations?

b) Explain Functional Dependency and Multivalued Dependency.

7. a) How the use of 2PL would prevent interference between the two transactions.

b) Explain the difference between strict 2PL and rigorous 2PL?

OR

8. Explain the Conflict Serializability and View Serializability?

9. Explain all the operations on B+ tree by taking a sample example

OR

10. Explain different recovery techniques used in transaction failure?

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
DATABASE MANAGEMENT SYSTEMS
MODEL QUESTION PAPER-2

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

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

1. a) Describe storage manager component of database system structure?
b) Explain levels of abstraction in DBMS

OR

2. a) What is partial key? How is it represented in ER diagram? Give an example?
b) What is a descriptive attribute? Explain?
c) Discuss the usage of ISA feature in ER diagram?

3. Write the SQL Queries from Sailors, Boats and Reserves relations
a. Find the names of Sailors who have reserved a red or a green boat?
b. Find the sids of sailors who have reserved at least one boat?
c. Find the average age of sailors with the rating of 10?
d. Find the sailors whose rating is better than some sailors called 'horatio'
e. Find the sailors who have reserved a blue boat on 01-01-2017.

OR

4. a) Define Relational Algebra with Selection and Projection Operation?
b) What are the differences between the two types of relational calculus?

5. Define BCNF? How does BCNF differ from 3NF? Explain with an example.

OR

6. a) What is Redundancy? What are the different problems encountered by redundancy? Explain them.
b) Goals of Normalization.?

7. What are the transaction isolation levels in SQL?

OR

8. Explain Validation Based Protocols with Suitable Examples

9. a) What is the relationship between files and Indexes?
b) What is the search key for an Index?
c) What is Data entry in an Index

OR

10. Explain a)Buffer Management b) Aries Algorithm c) Check Points.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
DATABASE MANAGEMENT SYSTEMS
MODEL QUESTION PAPER-3

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

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).
Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

1. Define DBMS? List Database system applications.
b) Explain DDL & DML commands with Suitable Examples?

OR

2. List four significant differences between a file processing system and a DBMS?
b) What is the class hierarchy? How is it represented in the ER diagrams?

3. a) Write a detail note on participation constraints?
b) Explain the types of Join Operations & Set Operations

OR

4. a) What are NULL values? Explain in detail.
b) Explain Having and Group By Clause.
c) Relational Algebra Notation with Example

5. a) Explain Purpose of Triggers with Suitable Examples?
b) Compare the Nested Queries and Correlated Queries?

OR

6. Explain following terms
a) What is Normalization? b) Explain Boyce Code NF c) Discuss the 1NF, 2NF, 3NF with example?

7. a) Explain Time stamp Based Protocols? Explain Thomas Write Rules?
b) Explain Growing Phase and Shrinking Phase of Locking Protocol?

OR

8. Explain Implementations of Atomicity and Durability with Suitable examples?

9. a) Explain Concurrent Transactions with Suitable examples?
b) Explain Cascading Rollback and Cascade less Rollback.

OR

10. Explain
a) Clustered Indexes b) Primary and Secondary Indexes c) Insertion in B+Tree

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
Managerial Economics and Financial Analysis
MODEL QUESTION PAPER-1

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

Note: This question paper consists of 5 sections. Answer five questions, choosing one question from each section and each question 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)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
Managerial Economics and Financial Analysis
MODEL QUESTION PAPER-2

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

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

SECTION-I

1. (a) Define managerial economics. Illustrate how it helps in solving managerial problems and explain the nature. (4M)
(b) Explain different methods of demand forecasting (6M)
(c) Briefly explain elasticity of demand. (4M)

OR

2. (a) What are the different kinds of elasticity of demand that are relevant to the manager of a firm? (7M)
(b) How do you forecast demand for a new product? (7M)

SECTION-II

3. (a) Explain the concepts of cost and explain their contribution to managerial decisions. [9M]
(b) Explain production function. [5M]

OR

4. (a) Discuss about isoquants. [4M)

(b) What is meant by breakeven analysis? Explain its advantages. (4M)

(c) Critically evaluate the law of diminishing marginal return. (6M)

SECTION-III

5(a) Explain the types of competition. [7M]

(b) What is perfect competition and explain its features. [7M]

OR

6. (a) Explain the state/ public enterprises and their various forms. [7M]

(b) What is the importance of pricing in a business organization? [7M]

SECTION-IV

7(a) Write different types of shares [7M]

(b) Define Financial Accounting. Explain the importance and Limitations of Financial Accounting. (7M)

OR

8. (a) what is accounting? Explain the principles of accounting. (7M)

(b) write the format and importance of balance sheet. (7M)

SECTION-V

9.(a) Illustrate the advantages and Disadvantages of NPV Method. (7M)

(b) A firm is considering two projects each with an initial investment of Rs.20,000 and a life of 4 years. The following is the list of estimated cash inflows after taxes and depreciation.
(7M)

year	Proposal I	Proposal II	Proposal III
1	12500	11750	13500
2	12500	12250	12500
3	12500	12500	12250
4	12500	13500	11750
total	50000	50000	50000

Predict Accounting Rate of Return on (i) Average Capital (ii) Original Capital Employed

OR

10(a) discuss different types of liquidity and activity ratios (7M)

(b) A Company has an estimated Life of 4 years and an investment opportunity costing Rs.2,50,000 with the following expected Net Cash flow After Taxes and Before Depreciation. (7M)

Years	Net cash flows (rs)	P.V. of Rs.1 @24% D.f
1	120000	0.806
2	90000	0.650
3	160000	0.524
4	30000	0.423

Calculate payback period and NPV using with 10% discounting factor

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MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
Managerial Economics and Financial Analysis
MODEL QUESTION PAPER-3

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

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

SECTION-I

1. (a) Explain the influencing factors of the elasticity of demand. (7M)
   (b) Define managerial economics and explain its areas (7M)

OR

2.(a) What is demand forecasting? Explain various factors involved in demand forecasting. (7M)
   (b) What is elasticity of demand? And explain its types and measurement. (7M)

SECTION-II

3.(a) Explain the importance production function and describe the salient features of Cobb-Douglas production function (7M)
   (b) Describe the importance of Break-even analysis and Break-even point. (7M)

OR

4.(a) You are required to Determine i)P/V Ratio (ii) Break Even Point in Value (iii) Sales required to earn a profit of Rs.4,50,000 and (iv) Profit when Sales are Rs.21,60,000 from the following information (7M)

Fixed Expenditure Rs.90,000,
Variable Cost Per unit :
Direct Material Rs.5
Direct Labour Rs.2
Direct Overheads 100% of Direct Labour
Selling price per unit Rs.12/-

(b) The Sales Turnover and profit during two years were given as follows: (7M)

Years	2003	2004
Sales (Rs.)	1,00,000	1,20,000
Profit (Rs.)	15,000	23,000

You are required to Compute the following: i)P/V Ratio ii) Fixed Cost iii) Break Even Point (Value) ii) Sales required to earn a profit of Rs.20,000 iii) Profit when Sales are Rs.1,25,000

(7M)

SECTION-III

5.(a) define business. Explain its characteristics

(b) Explain the salient features of private limited and public limited companies (7M)

OR

(7M)

6. (a) Describe the features of perfect competition.

(b) Make a comparison among Monopolistic, Monopoly and Oligopoly competition? (7M)

SECTION-IV

7.(a) Describe different types of capital. (7M)

(b)explain about different methods and sources of capital (7M)

OR

8.(a) Describe the advantages and disadvantages of double entry book keeping (7M)

(b) Prepare Trial Balance of Mr.Rajaram as on 31.12.2005 from the following balances:

1. Sundry Debtors 32,000	9.Stock as on 1.1.2005 22,000
2. Cash in Hand 35	10. Cash at Bank 1,545
3. Plant &Machinery 17,500	11. Sundry Creditors 10,650
4. Trade expenses 1,075	12. Sales 2,34,500
5. Salaries 2,225	13.Carriage Outwards 400
6. Rent 900	14.Bills Payable 7,500
7. Purchases 2,18,870	15.Discount Allowed 1,100
8. Capital 79,500	16.Business Premises 34,500

SECTION-V

9.(a) Briefly explain the traditional methods of capital budgeting.

(7M)

(b) Briefly describe the modern methods of capital budgeting. (7M)

OR

10 (a) describe the advantages and disadvantages of traditional methods of capital budgeting (7M)

(b) The following is an extract of a balance sheet of a company during the last year. Compute current ratio and quick ratio. Also interpret the ratios.

(7M)

Land and buildings 1,50,000,	Plant and machinery 3,00,000,
Furniture and fixtures 1,25,000,	Closing stock 25,000,
Sundry debtors 62,500,	Wages prepaid 7,500,
Sundry creditors 18,000,	Rent outstanding 12,000

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
OPEN ELECTIVE 1: ELEMENTS OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER-1

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

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

1) a. Derive the relation between E,N, and K bars of uniform strength for compound bars? [8]

b. Two forces act at an angle of 1200, the bigger force is of 40N and th resultant is [6] perpendicular to the smaller one. Find the smaller force. And state the law of transmissibility.

(OR)

2) a) Derive the formula of shear force, bending moment for cantilever and simply supported beam without overhanging for all types of loads. [8]

b) Explain briefly about shear force and bending moment? [6]

3) a. Define bending stress and moment of resistance. [7]
b. Find the section modulus of a circular section whose section diameter is 28 mm.
c. Explain theory of simple bending. [7]

(OR)

4) a. Derive lames equation for cylinders subjected to inside and outside pressures. [8]
b. Explain circumferential stress and longitudinal stress? [6]

5) a. Derive the continuity equation for pipes are arranged in parallel. [7]
b. Define stream line, streak line and path line. [7]

(OR)

6) a. What assumptions are made in the theory of the simple bending? [7]
b. Derive Bernoulli's equation. [7]
7) a. Explain working principle of four stroke petrol engine. [8]
b. Write the comparison of CI and SI engines. [6]

(OR)

8) a. What are the applications of power transmission? [8]

b. What is power transmission? And explain briefly those [6]

9) a. Write the types of power transmission? [7]

b. What are the advantages disadvantages of belt drives?

c. write the importance of power transmission of gears? [5]

(OR)

10) a. Derive the power formula for crossed belt drives. [9]

b. Write the classification of gears. [5]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
OPEN ELECTIVE 1: ELEMENTS OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER-2

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

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

1) a. Explain briefly about shear force and bending moment? [7]

b. Derive the formula of shear force, bending moment for cantilever and simply supported beam without overhanging for all types of loads. [7]

(OR)

2) a. Explain circumferential stress and longitudinal stress? [7]

b. Derive lames equation for cylinders subjected to inside and outside pressures. [7]

3) a. Explain working principle of hydraulic pumps. [7]

b. Explain working principle of turbines. [7]

(OR)

4) a. Derive the continuity equation for pipes are in series. [7]

b. Derive the continuity equation for pipes arranged in parallel. [7]

5) Define the terms
I) Indicated power
II) Brake power
III) Specific fuel consumption
IV) Brake Friction power
V) thermal efficiency
VI) Indicated thermal efficiency
VII) Mechanical efficiency [14]

(OR)

6) a. Define IC engine and write the classification of IC engines. [7]
b. What are the advantages disadvantages of belt drives? [7]
7) a. what are the differences between thick and thin cylinders [7]
b. explain the modes of failure in thin cylindrical shell due to an internal pressures. [7]

(OR)

8) a. What are the advantages of lubrication in IC engine?
b. What is four stroke engines? [7]
c. A trial carried out in a four stroke single cylinder gas engine gave the following results. Cylinder dia=300 mm, Engine stroke=500mm, Clearance volume=6750cc, Explosions per minute=100 Pmax KN/m2 = 765 Net work load on the brake=190kg Brake dia=1.5m Rope dia=2 5mm, Speed of the engine=240rpm, Gas used=30 m3/kghr , Calorific value of gas=2 0515 KJ/ m3 . Determine compression rat io, mechanical efficiency, indicated thermal efficiency, air standard efficiency, relative efficiency, assume r=1.4 [7]

9) The following observations are recorded during a test on a four-stroke petrol engine, F.C = 3000 of fuel in 12sec, speed of the engine is 2500rpm, B.P = 20KW, Air intake orifice diameter = 35 mm,Pressure across the orifice = 140mm of water coefficient of discharge of orifice = 0.6 , piston diameter = 150mm, stroke length = 100 mm, Density of the fuel = 0.85gm/cc , r=6 .5, Cv of fuel = 42000KJ/Kg, Barometric pressure = 760mm of Hg , Room temperature = 24oc [14]

(OR)

10) Draw and explain nomenclature of open belt drive [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
B.Tech II Year II Semester External Examinations
OPEN ELECTIVE 1: ELEMENTS OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER-3

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

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

1) Describe, with the aid of a diagram, an experiment to determine the Young's modulus of steel in the form of a wire. Explain how to use your readings to obtain the Young's modulus. [14]

(OR)

2) a. Derive the relation between E,N, and K bars of uniform strength for compound bars? [7]

b.A wire of a length 1m and diameter of 0.4mm is hung from a ceiling. Find the extension caused in the wire, by attaching a weight of 100N, if the material of the wire has the Young's modulus (E) of 200x1011Nm-2. [7]

3) a. The greatest tensile stress which steel of a particular sort can withstand without breaking is about 109 N m^{-2}. A wire of cross-sectional area 0.01 mm^2 is made of this steel. What is the greatest force that it can withstand? [7]

b. A large crane has a steel lifting cable of diameter 36 mm. The steel used has a Young modulus of 200 Gpa. When the crane is used to lift 20 kN, the unscratched cable length is 25.0 m. Calculate the extension of the cable. [7]

(OR)

4) a. What assumptions are made in the theory of the simple bending? [7]

b. Derive the bending equation. [7]

5) a. Derive Bernoulli's equation.

b. Explain working principle of hydraulic pumps. [7]

c. Explain working principle of four stroke diesel engine. [7]

(OR)

8) a.What are the differences between the petrol engine and diesel engine? [7]

b. Explain working principle of four stroke petrol engine. [7]

c. The following 143bservant ions are recorded during a test on a four-stroke petrol engine, F.C = 3000 of fuel in 12sec, speed of the engine is 2500rpm, B.P = 20KW, Air intake orifice diameter = 35 mm,Pressure across the orifice = 140mm of water coefficient of discharge of orifice = 0.6 , piston diameter = 150mm, stroke length = 100 mm, Density of the fuel = 0.85gm/cc , r=6 .5, Cv of fuel = 42000KJ/Kg, Barometric pressure = 760mm of Hg , Room temperature = 24oc [14]

9) A trial carried out in a four stroke single cylinder gas engine gave the following results. Cylinder dia=300 mm, Engine stroke=500mm, Clearance volume=6750cc, Explosions per minute=100 Pmax KN/m2 = 765 Net work load on the brake=190kg Brake dia=1.5m Rope dia=2 5mm, Speed of the engine=240rpm, Gas used=30 m3/kghr , Calorific value of gas=2 0515 KJ/ m3 . Determine compression rat io, mechanical efficiency, indicated thermal efficiency, air standard efficiency, relative efficiency, assume r=1.4 [14]

(OR)

10) a. What are the advantages disadvantages of belt drives? [7]

b. define the terms

i) Pitch point

ii) Circular pitch

iii) Diametric pitch

iv) Addendum circle

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