Linear Algebra and ODE
I B.Tech –I Semester (Code: 18MA001)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:** None

**Course Objectives:**

CO1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

CO2: Identify the type of a given differential equation and select and apply the appropriate analyticaltechnique for finding the solution of first order and higher order ordinary differential equations.

CO3: Create and analyze mathematical models using first and second order differential equations
to solve application problems that arises in engineering.

CO4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

**Course Outcomes:** Students will be able to

CLO-1:Apply elementary row operations to find the rank of a matrix, to solve a system of linear equations and to find the inverse of a matrix.

CLO-2:Find the Eigen values and Eigen vectors of the given square matrix and also compute the higher
powers of the given matrix.

CLO-3: Solve separable, linear, exact differential equations with and without initial conditions.

CLO-4:Distinguish between linear and non-linear differential equation.

CLO-5: Write the piecewise continuous functions in terms of unit step functions and hence find its Laplace transforms.

CLO-6:Solve linear differential equation with constant coefficients and unit step input functions using
Laplace transforms technique.

## SYLLABUS

### UNIT - I

**Linear Algebra**: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).

[Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.]

[12 Hours]

## UNIT - II

**Differential Equations of first order**: Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy=0.

Applications of a first order Differential equations: Newton's law of cooling; Rate of decay of Radio-active materials.

[Sections: 11.1; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; 12.6; 12.8] [12 Hours]

## UNIT – III

**Linear Differential Equations**: Definitions; Theorem; Operator D; Rules for finding the complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations: Oscillatory Electrical Circuits.

[Sections: 13.1; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5]

[12 Hours]

## UNIT – IV

**Laplace Transforms:** Definition; conditions for the existence; Transforms of elementary functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by $t^n$; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms.

[Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1]

[12 Hours]

**TEXT BOOK**:

B.S.Grewal, "Higher Engineering Mathematics", 44th edition, Khanna publishers, 2017.

**REFERENCE BOOKS:**

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

## ENGINEERING CHEMISTRY-1

**(Common to all branches)**

I B.Tech – I/II Semester (Code: 18CY001)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**PREREQUISITES:None**

**COURSE OBJECTIVES:** The student should be conversant:

CO1: With the principles of water characterization and treatment of water for industrial purposes and methods of producing water for potable purposes.
CO2: To understand the thermodynamic concepts, energy changes, concept of corrosion & its control.
CO3: With the conventional energy sources, solid, liquid and gaseous Fuels & knowledge of knocking and anti-knocking characteristics.
CO4: With aim to gain good knowledge of organic reactions, plastics, conducting polymers & biodegradable polymers.

**COURSE OUTCOME:**

After studying this course, students will be able to:

CLO-1: Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
CLO-2: Apply their knowledge in converting various energies of different systems and protection of different metals from corrosion.
CLO-3: Have the capacity of applying energy sources efficiently and economically for various needs.
CLO-4: Design economically and new methods of organic synthesis andsubstitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.

**UNIT I: Water Chemistry** **15 hrs**

**Introduction:** water quality parameters
**Characteristics**: Alkalinity, Hardness **-** Estimation & simple neumerical problems,
**Boiler Troubles** - Sludges, Scales, Caustic embrittlement, boiler corrosion, Priming and foaming;
**Internal conditioning-** phosphate, calgon and carbonate methods.
**External conditioning** - Ion exchange process & Zeolite proess
WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration. Disinfection methods: Chlorination, ozonization and UV treatment.
Salinity – Treatment of Brackish water by Reverse Osmosis and Electrodialysis.

**UNIT II** **15 hrs**

**Thermodynamic functions**: energy, entropy and free energy. Estimations of entropy and free energies.Free energy and emf.Cell potentials, the Nernst equation and applications.

**Corrosion:** Types of corrosion - Chemical or dry corrosion, Electrochemical or wet corrosion; Galvanic, stress, pitting and differential aeration corrosion; Factors effecting corrosion, **Corrosion control** – Cathodic protection, and electro plating (Au)&electoless Ni plating.

**UNIT III: Fuels** **15 hrs**

Classification of fuels; Calorific value of fuels (lower, higher)
**Solid fuels**: Determination of calorific value (Bomb Calorimeter) & related problems, Coal ranking,
**Liquid Fuels:** Petroleum refining and fractions, composition and uses. Knocking and anti-knocking Agents, Octane number and Cetane number; Bio fuels- Biodiesel, general methods of preparation and advantages
**Gaseous fuels:** CNG and LPG,
Flue gas analysis – Orsat apparatus.

**UNIT IV:** **15 hrs**

**Organic reactions and synthesis of a drug molecule**
Introduction to reactions involving substitution ($SN^1$, $SN^2$), addition (Markownikoff's and anti-Markwnikoff's rules) , elimination ($E_1$& $E_2$), Synthesis of a commonly used drug molecule.(Aspirin and Paracetamol)
**Polymers:** Conducting polymers: Classification, Intrinsic and Extrinsic conducting polymers and their applications**.** Plastics: Thermoplasts and thermosetting plastics, Bskelite and PVC.
Bio degradable polymers: types, examples-Polyhydroxybuterate (PHB), Polyhydroxybuterate-co-β-hydroxyvalerate (PHBV), applications.

**TEXT BOOKS:**

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 17th edition (2017).
2. SeshiChawla, "Engineering Chemistry"DhanpatRai Pub, Co LTD, New Delhi 13 th edition, 2013.

**REFERENCES:**

1 Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers, 12th Edition, 2012.

2 Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).

3 Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015.

Environmental Studies

I B.Tech – I/II Semester (Code: 14CE001)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 2 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:** None

**Course Objectives:** To learn

**CO1**: To develop an awareness,knowledge, and appreciation for the naturalenvironment.

**CO2**: To understand different types of ecosystems exist in nature.

**CO3**: To know our biodiversity.

**CO4**: To understand different types of pollutants present in Environment.

**CO5**: To know the global environmental problems.

**Course Outcomes:** Students will be able to

**CLO 1**: Develop an appreciation for the local and natural history of the area.

**CLO 2**: Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.

**CLO 3**: Know how to manage the harmful pollutants.

**CLO 4**: Gain the knowledge of Environment.

**CLO 5**: Create awareness among the youth on environmental concerns important in the long-term interest of the society

## UNIT – I

**Introduction:** Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries). *6 periods*

**Biodiversity:** Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation. *Chipko movement case study* *6 periods*

## UNIT – II

**Natural resources: Land**: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. **Forest**: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. **Water**: Uses, floods and drought, Dams - benefits and problems.

**Energy**: Importance of energy, Environmental Impacts of Renewable and Non-renewable energy resources. *Silent Valley Project and Narmada BachaoAndolan case studies8 periods*

**Sustainability:** Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management. Fieldwork on Rain water harvesting and Watershed management. *6 periods + 6 hours field work/Demonstration*

**UNIT – III**

**Pollution:** Definition; Causes, effects and control of air, water and nuclear pollution; *Chernobyl Nuclear Disaster* case study; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting. *12 periods*

**Environmental acts:** Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act.
*6 periods*

**UNIT – IV**

**Environmental issues:** Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.Environmental Standards (ISO 14000, etc.) *12 periods*
**Case Studies:** Bhopal Tragedy, Mathura Refinery and TajMahal, and Ralegan Siddhi (Anna Hazare). *6 periods*

**Field work:** Visit to a local area to document environmental assets – Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture. *6 hrs.*

**TEXT BOOKS**:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
3. Text Book of environmental Studies – ErachBharucha

**REFERENCE BOOKS:**

1. "Environmental studies", R.Rajagopalan, Oxford University Press.
2. "Introduction to Environmental Science", Anjaneyulu Y, B S Publications
3. "Environmental Science", 11th Edition – Thomson Series – By Jr. G. Tyler Miller.

## Basic Electrical and Electronics Engineering

*(Common for CSE,IT,ME branches)*

I B.Tech – I Semester (Code: 18EE001)

| Lectures | 4 | Tutorial | 1 | | Practical | 0 | Credits | 4 | |
|---|---|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | | | : | 50 | Semester End Examination (3 Hours) | | | : | 50 |

**Prerequisites:**Mathematics, Physics

**Course Objectives:**

CO1: To understandbasic Laws in circuits, analysis of simple DC circuits, Theorems and its applications, fundamentals of AC circuits & its analysis and concepts of three phase balanced circuits.

CO2: To learn basic properties of magnetic materials and its applications..

CO3: To understand working principle, construction, applications and performance of DC machines, AC machines.

CO4: To learn basic concepts, working principal, characteristics and applications of semiconductor diode and transistor family.

CO5: To gain knowledge about the static converters and regulators.

CO6: To learn basic concepts of power transistors and operational amplifiers closer to practical applications.

**Course Outcomes:** Students will be able to

CO1: Solve problems involving with DC and AC excitation sources in electrical circuits.

CO2: Compare properties of magnetic materials and its applications.

CO3: Analyze construction, principle of operation, application and performance of DC machines and AC machines.

CO4: Explore characteristics and applications of semiconductor diode and transistor family.

CO5: Make the static converters and regulators.

CO6: Analyze concepts of power transistors and operational amplifiers closer to practical applications.

### UNIT – I

**Electrical Circuits**

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation.Superposition, Thevenin and Norton Theorems. Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase AC circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections.

## UNIT –II

**Electrical Machines (18 hours)**

Magnetic materials, BH characteristics, Construction, working of DC machines, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.Auto-transformer and three-phase transformer connections.Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor.Single-phase induction motor. Construction and working of synchronous generators.

## UNIT-III

**Semiconductor Diodes and applications**

Semiconductor materials, semiconductor diode, Resistance levels, Diode equivalent circuits, Zener diode, Light emitting diode, Load line analysis, half wave rectification, Full wave rectification, Bridge rectifier, Use of capacitor filter in rectifier, Zener diode voltage regulator, Clippers, Clampers

**Bipolar Junction Transistors**

Transistor construction and operation, Common base configuration, Transistor amplifying action, Common emitter configuration, Common collector configuration, Limits of operation. DC load line and bias point, Voltage divider bias of transistor.

## UNIT-IV

**Field Effect Transistors**

Construction and characteristics of JFET and MOSFET

**Operational Amplifiers**

Introduction, Differential and common mode operation, OP-AMP Basics, Practical OP-AMP circuits: Inverting amplifier, Non inverting amplifier, Unity follower, summing amplifier, Integrator and differentiator.

**TEXT BOOK**:

1. S.K. Bhattacharya, “Basic Electrical and Electronics Engineering”, Pearson Publications
2. Robert L. Boylestad& Louis Nashelsky, ‘ Electronic Devices and circuit theory’, PHI Pvt.Limited, 11th edition
3. “Basics of Electrical and Electronics Engineering”, Nagsarkar T K and Sukhija M S, Oxford press University Press.

**Reference Books:**

1. David A. Bell, ‘Electronic Devices and Circuits’, oxford publisher,5th edition
2. “Basic Electrical, Electronics and Computer Engineering”, Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition, (2006).

Engineering Graphics

I B.Tech – I Semester (Code: 18MEL01)

| Lectures | 1 | Tutorial | 0 | Practical | 4 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:** None

**Course Objectives:** To learn

CO1: clear picture about the importance of engineering graphics in the field of engineering

CO2: the drawing skills and impart students to follow Bureau of Indian Standards

CO3: To give an idea about Geometric constructions, Engineering curves, orthographic projections and pictorial projections

CO4: imagination skills about orientation of points, lines, surfaces and solids

CO5: basic drafting skills of AutoCAD

**Course Outcomes:** Students will be able to

CLO-1: draw projections of points and projections of lines using Auto CAD

CLO-2: plot projections of surfaces like circle, square and rhombus

CLO-3: plot the Projections of solids like Prisms and pyramids

CLO-4: convert the of Orthographic views into isometric views of simple objects

CLO-5: generate the of pictorial views into orthographic views of simple castings

**UNIT – I**

**INTRODUCTION:** Introduction to Drawing instruments and their uses, geometrical construction procedures

**INTRODUCTION TO AUTOCAD:**

Basics of sheet selection, Draw tools, Modify tools, dimensioning

**METHOD OF PROJECTIONS:** Principles of projection - First angle and third angle projectionof points. Projection of straight lines.Traces of lines.

**UNIT II**

**PROJECTIONS OF PLANES:** Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

**UNIT – III**

**PROJECTIONS OF SOLIDS:** Projections of Cubes, Prisms, Pyramids, Cylinders and Cones Inclined to one plane.

**UNIT –IV**

**ISOMETRIC PROJECTIONS:** Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

**UNIT –V**

**ORTHOGRAPHIC PROJECTIONS:** Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

**TEXT BOOK**:

1. Engineering Drawing with AutoCAD by Dhananjay M. Kulkarni (PHI publication)
2. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)

**REFERENCE BOOKS:**

1. Engineering Drawing by Dhananjay A Jolhe, Tata McGraw hill publishers
2. Engineering Drawing by Prof.K.L.Narayana& Prof. R.K.Kannaiah.

## ENGINEERINGCHEMISTRY LABORATORY

**(Common to all branches)**

I B.Tech – I/II Semester (Code: 18CYL01)

| Lectures | 0 | Tutorial | 0 | Practical | 3 | Credits | 1 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**LIST OF EXPERIMENTS**

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. and error, accuracy, precision, theory of indicators, use of volumetric titrations).

2. **Volumetric Analysis:**
   a. Estimation of Washing Soda.
   b. Estimation of Active Chlorine Content in Bleaching Powder
   c. Estimation of Mohr's salt by permanganometry.
   d. Estimation of given salt by using Ion-exchange resin using Dowex-50.
3. **Analysis of Water:**
   a. Determination of Alkalinity of Tap water.
   b. Determination of Total Hardness of ground water sample by EDTA method
   c. Determination of Salinity of water sample
4. **Estimation of properties of oil**:
   a. Estimation of Acid Value
   b. Estimation of Saponification value
5. **Preparations:**
   a. Preparation of Soap
   b. Preparation of Urea-formaldehyde resin
   c. Preparation of Phenyl benzoate
6. **Demonstration Experiments (Any two of the following):**
   a. Determination of $p^H$ of given sample.
   b. Determination of conductivity of given sample by conductometer.
   c. Potentiometric Determination of Iron.

**TEXT BOOKS (for Chemistry 1 and 2):**

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad, 2009.
2. Inorganic quantitative analysis, Vogel, $5^{th}$ edition, Longman group Ltd. London, 1979.

**REFERENCE BOOKS:**

1. Text Book of engineering chemistry by R.n. Goyal and HarrmendraGoel.
2. A text book on experiments and calculations- Engineering Chemistry. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

Workshop Practice

I B.Tech – I & II Semester (Code: 18MEL02)

| Lectures | 0 | Tutorial | 0 | Practical | 3 | Credits | 1 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:** None

**Course Objectives:**

1. To impart student knowledge on various hand tools for usage in engineering applications.
2. Be able to use analytical skills for the production of components.
3. Design and model different prototypes using carpentry, sheet metal and welding.
4. Make electrical connections for daily applications.
5. To make student aware of safety rules in working environments.

**Course Outcomes:**After completion of this course student should be able to:

1. Make half lap joint, Dovetail joint and Mortise &Tenon joint
2. Produce Lap joint, Tee joint and Butt joint using Gas welding
3. Prepare trapezoidal tray, Funnel and T-joint using sheet metal tools
4. Make connections for controlling one lamp by a single switch, controlling two lamps by a single switch and stair case wiring.

**Syllabus:**

1. Carpentry
   a. Half Lap joint
   b. Dovetail joint
   c. Mortise &Tenon joint
2. Welding using electric arc welding process/gas welding
   a. Lap joint
   b. Tee joint
   c. Butt joint
3. Sheet metal operations with hand tools
   a. Trapezoidal tray
   b. Funnel
   c. T-joint
4. House wiring
   a. To control one lamp by a single switch
   b. To control two lamps by a single switch
   c. Stair-case wiring

**TEXT BOOKS**:

1. P.Kannaiah and K.L.Narayana, Workshop Manual, SciTech Publishers, 2009.

K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008

## Basic Electrical and Electronics Engineering Lab

*(Common for CSE,IT,ME branches)*

I B.Tech – I Semester (Code: 18EEL01)

| Lectures | 0 | Tutorial | 0 | | Practical | 3 | Credits | 1 | |
|---|---|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | | | : | 50 | Semester End Examination (3 Hours) | | | : | 50 |

Lab experiments

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Parameters of choke coil
6. Measurement of low and medium resistance using volt ampere method
7. OC & SC test of single phase transformer
8. Load test on single phase transformer
9. V-I characteristics of PN junction Diode
10. V-I characteristics of Zener Diode
11. Characteristics of CE Configuration
12. Transfer and Drain Characteristics of JFET
13. Calculation of Ripple factor using Half wave rectifier
14. Calculation of Ripple factor using Full wave rectifier
15. Non linear wave shaping – clippers/clampers

Note: Minimum 10 experiments should be carried.

Numerical Methods and Advanced Calculus
I B.Tech –II Semester (Code: 18MA002)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:** None

**Course Objectives:**
CO1: To learn about some advanced numerical techniques e.g. solving a nonlinear equation, linear system of equations, Interpolation and Approximation techniques.
CO2: To learn about evaluation of double and triple integrals and their applications.
CO3: To learn some basic properties of scalar and vector point functions and their applications to line,surface and volume integrals.

**Course Outcomes:** Students will be able to
CLO-1: Solve non-linear equations in one variable and system of linear equations using iteration methods.
CLO-2: Choose appropriate interpolation formulae based on the given data.
CLO-3: Compute the value of a definite integral using numerical integration techniques.
CLO-4: Predict the numerical solution of the derivative at a point from the given initial value problem using appropriate numerical method.
CLO-4 :Evaluate the double and triple integrals using change of variables.
CLO-5: Transformline integrals to surface and surface to volume integrals and evaluate them.

## SYLLABUS

### UNIT - I

**Numerical Solution of Equations**: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method.

[Sections: 28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2]. [12 Hours]

### UNIT - II

**Finite differences and Interpolation**: Finite differences: Forward differences, Backward differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's backward interpolation formula; Interpolation with unequal intervals; Lagrange's interpolation formula; Divided differences; Newton's divided difference formula; Numerical integration; Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule;

Numerical solution of ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.

[Sections:29.1; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.8; 32.1; 32.2; 32.4; 32.7]. [12 Hours]

**UNIT – III**

**Multiple Integrals**: Double integrals; Change of order of integration; Double integrals in polar coordinates; Area enclosed by plane curves; Triple integrals; Volumes of solids: Volume as Triple integrals, Change of variables.

[Sections: 7.1; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2]. [12 Hours]

**UNIT – IV**

**Vector calculus and its Applications:** Scalar and vector point functions; Del applied to scalar point functions-Gradient: Definition, Directional derivative; Del applied to vector point functions: Divergence, Curl; Line integral; Surfaces: Surface integral, Flux across a surface; Green's theorem in the plane (without proof); Stokes theorem (without proof); Gauss divergence theorem(without proof).

[Sections: 8.4; 8.5.1; 8.5.3; 8.6; 8.11; 8.12; 8.13; 8.14; 8.16] [12 Hours]

**TEXT BOOK**:

B.S.Grewal, "Higher Engineering Mathematics", 44$^{th}$edition, Khanna publishers, 2017.

**REFERENCE BOOKS:**

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9$^{th}$ edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

SEMICONDUCTOR PHYSICS AND NANO MATERIALS
¼ B.Tech II-semester: CODE:18PH003
(Common for CSE,IT,EEE,&EIE)

| Lectures | 3 | Tutorials | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | | | 50 | Semester End Examination | | | 50 |

Course Objectives:

CO1: This unit aim to build the foundation and inspires interest of freshmen into electrical and electronics and to focus on fundamental concepts and basic principles regarding electrical conduction.

CO2: This unit provides various properties of semiconductor materials and their importance in various device fabrications.

CO3: This unit aim to educate the student on various opto-electronic devices and their applications.

CO4: This unit provide information about the principles of processing, manufacturing and characterization of nanomaterials, nanostructures and their applications.

COURSE OUTCOMES:

The students were able to

CLO1: understand concepts of band structure of solids, concept of hole and effective mass of electron in semiconductors.

CLO2: know the concept of Fermi level and various semiconductor junctions.

CLO3: familiar with working principles of various opto-electronic devices and their applications.

CLO4: understand importance of nano-materials and their characteristic properties.

UNIT -I

ELECTRONIC MATERILAS:

Sommerfeld free electron theory, Fermi level and energy, density of states, Failure of free electron theory (Qualitative), Energy bands in solids, E-K diagrams, Direct and Indirect band gaps. Types of Electronic materials: Metals, Semi conductors and Insulators, Occupation Probability, effective mass, Concept of hole.

UNIT – II

SEMICONDUCTORS:

Introduction to semiconductors, intrinsic and extrinsic semiconductors, carrier concentrations, Fermi level and temperature dependence, Continuity equation, Diffusion and drift, P-N junction (V-I characteristics), Metal – Semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for opto- electronic devices.

UNIT-III

OPTO-ELECTRONIC DEVICES AND DISPLAY DEVICES:

Photo voltaic effect, principle and working of LED, Applications of Photo diode, Solar cell, PIN & APD Diode, Liquid crystal display, Opto electric effect: Faraday Effect and Kerr effect.

UNIT-IV

NANO-MATERIALS:

Introduction to nano technology, quantum confinement, surface to volume ratio, properties of nano materials, synthesis of nano-materials: CVD, sol-gel methods, laser ablation.

Carbon nano tubes: types, properties, applications. Characterization of nano materials: XRD, SEM, applications of nano materials.

TEXT BOOKS:

1. A text book of engineering physics by Avadhanulu and KshirsagarS.Chand& Co. (2013)
2. Applied physics by Dr.*P.SrinivasaRao*. Dr.K.*Muralidhar*
3. Introduction to solid state state physics, Charles Kittel, 8th edition
4. Solid state physics, S.O. Pillai

REFERENCE BOOKS:

1. Text book on Nanoscience and Nanotechnology (2013): B.S. Murty, P. Shankar, Baldev Raj, B.B. Rath and J. Murday, Springer Science & Business Media.
2. Basic Engineering Physics ,Dr.*P.SrinivasaRao*. Dr.K.*Muralidhar.* Himalaya Publications, 2016

**PROFESSIONAL ETHICS & HUMAN VALUES**
(Common for all branches)

I B.Tech – II Semester (Code:18CS203)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:**None

**Course Objectives:** Student will be able to

1. Comprehend a specific set of behaviour and values any professional must know and must abide by, including confidentiality, honesty and integrity. Understand engineering as social experimentation.
2. Know, what are safety and Risk and understand the responsibilities and rights of an engineer such as collegiality, loyalty, bribes/gifts.
3. Recognize global issues visualizing globalization, cross-cultural issues, computer ethics and also know about ethical audit
4. Discuss case studies on Bhopal gas tragedy, Chernobyl and about codes of Institute of Engineers, ACM

**Course Outcomes:** Student will be able to:

1.1 Know, about human values and virtues such as integrity, civic virtue, respecting others
1.2 Learn the importance of living peacefully, caring and sharing, empathy.
1.3 Understand the basics of Engineering Ethics such as Consensus and Controversy, Profession and Professionalism, Professional Roles of Engineers.
1.4 Debate on Ethical Theories like Kohlberg's Theory, Gilligan's Argument.
1.5 Learn Engineering as Social Experimentation, Comparison with Standard Experiments, Knowledge Gained, Conscientiousness, Relevant Information, Learning from the Past.
1.6 Propose Engineers as Managers, Consultants, and Leaders, understand Roles of Codes.
2.1 Determine what is safety and risk, types of risks, analyse risk-benefit
2.2 Discuss responsibilities and rights of engineers, Collegiality, Two Senses of Loyalty, Obligations of Loyalty, Misguided Loyalty, Professionalism and Loyalty,
2.3 Debate on Professional Rights, Professional Responsibilities, Conflict of Interest, Self-interest, Customs and Religion, Collective Bargaining,
2.4 Explain Confidentiality, Acceptance of Bribes/Gifts, Occupational Crimes, Whistle Blowing.
3.1 Visualise Globalization, Cross-cultural Issues, Environmental Ethics, Computer Ethics, Weapons Development.
3.2 Discuss Ethical Problems in Research, Intellectual Property Rights (IPRs).
3.3 Know the importance of Ethical Audit, Aspects of Project Realization, Ethical Audit Procedure, The Decision Makers,
3.4 Understand Variety of Interests, Formulation of the Brief, The Audit Statement, The Audit Reviews.

4.1 Discuss Case Studies: Bhopal Gas Tragedy, The Chernobyl Disaster
4.2 Know about Institution of Engineers (India): Sample Codes of Ethics.
4.3 Comprehend ACM Code of Ethics and Professional Conduct.

## UNIT – I

**Human Values**: Morals, Values and Ethics, Integrity, Work Ethics, Service and Learning, Civic Virtue, Respect for Others, Living Peacefully, Caring and Sharing, Honesty, Courage, Value Time, Cooperation, Commitment and Empathy, Spirituality, Character.
**Engineering Ethics**: History of Ethics, Engineering Ethics, Consensus and Controversy, Profession and Professionalism, Professional Roles of Engineers, Self Interest, Customs and Religion, Uses of Ethical Theories, Professional Ethics, Types of Inquiry, Kohlberg's Theory, Gilligan's Argument, Heinz's Dilemma.
**Engineering as Social Experimentation**: Comparison with Standard Experiments, Knowledge Gained, Conscientiousness, Relevant Information, Learning from the Past, Engineers as Managers, Consultants, and Leaders, Accountability, Roles of Codes, Codes and Experimental Nature of Engineering.

## UNIT II

**Engineers' Responsibility for Safety and Risk**: Safety and Risk, Types of Risks, Safety and the Engineer, Designing for Safety, Risk-Benefit Analysis, Accidents.
**Responsibilities and Rights**: Collegiality, Two Senses of Loyalty, Obligations of Loyalty, Misguided Loyalty, Professionalism and Loyalty, Professional Rights, Professional Responsibilities, Conflict of Interest, Self-interest, Customs and Religion, Collective Bargaining, Confidentiality, Acceptance of Bribes/Gifts, Occupational Crimes, Whistle Blowing.

## UNIT III

**Global Issues**: Globalization, Cross-cultural Issues, Environmental Ethics, Computer Ethics, Weapons Development, Ethics and Research, Analyzing Ethical Problems in Research, Intellectual Property Rights (IPRs).
**Ethical Audit:** Aspects of Project Realization, Ethical Audit Procedure, The Decision Makers, Variety of Interests, Formulation of the Brief, The Audit Statement, The Audit Reviews.

## UNIT IV

**Case Studies**: Bhopal Gas Tragedy, The Chernobyl Disaster.
**Appendix 1**: Institution of Engineers (India): Sample Codes of Ethics.
**Appendix 2**: ACM Code of Ethics and Professional Conduct.

**TEXT BOOK**:

1. "Professional Ethics & Human Values", M.GovindaRajan, S.Natarajan, V.S.SenthilKumar, PHI Publications 2013.

**REFERENCE BOOKS:**

1. "Ethics in Engineering", Mike W Martin, Ronald Schinzinger, TMH Publications.

## DIGITAL LOGIC DESIGN

I B.Tech – II Semester(Code: 18CS204)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites:**Basic Computer Knowledge.

**Course Objectives:** Students will be able to:

1. Understand of the fundamental concepts and techniques used in digital electronics, and Number conversions.
2. Understand basic arithmetic operations in different number systems and simplification of Boolean functions using Boolean algebra and K-Maps.
3. Simplify the Boolean functions using Tabulation method, Concepts of combinational logic circuits.
4. Understand the concepts of Flip-Flops, Analysis of sequential circuits.
5. Understand the concepts of Registers, Counters and classification of Memory units.

**Course Outcomes:** Students will be able:

1. To perform all the basic arithmetic operations in various number systems.
2. To perform subtraction operation using various complements.
3. To learn various Boolean algebraic rules and laws.
4. To simplify Boolean function using Boolean algebraic rules and laws.
5. To learn various Logic gates.
6. To simplify Boolean functions using K-Map method.
7. To simplify Boolean functions using Tabulation method.
8. To Analyze and design of various Combinational logic circuits.
9. To learn various functionalities of Flip-Flops.
10. To Analyze and design of various Sequential logic circuits.
11. To Analyze and design of Registers, Counters & Types of memories.

### UNIT – I

**DIGITAL SYSTEMS AND BINARY NUMBERS:** Digital System, Binary Numbers, Number base Conversions, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic, Error Detection and Correction: 7 bit Hamming Code.

**BOOLEAN ALGEBRA & LOGIC GATES**: Introduction, Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard Forms, Other Logic Operations, Digital logic gates.

**GATE –LEVEL MINIMIZATION**: Introduction, The map method, Four-variable K-Map, Product-of-Sums Simplification, Don't –Care Conditions, NAND and NOR implementation, Other Two level Implementations.

## UNIT II

**MINIMIZATION:** The Tabulation method, Determination of prime implicants, Selection of prime-implicants.

**COMBINATIONAL LOGIC:** Introduction, Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adders - Subtractor, Decimal Adder, Magnitude Comparator, Decoders, Encoders, Multiplexers.

## UNIT III

**SYNCHRONOUS SEQUENTIAL LOGIC:** Introduction, Sequential Circuits, Storage Elements - Latches, Storage Elements -Flip Flops, Analysis of Clocked Sequential Circuits: State Equations, State Table, State Diagram, Flip Flop Input Equations, Analysis with D, JK and T Flip Flops; State reduction and Assignment, Design Procedure.

## UNIT IV

**REGISTERS and COUNTERS**: Registers, Shift registers, Ripple Counters, Synchronous Counters.

**MEMORY and PROGRAMMABLE LOGIC:** Introduction, Random Access Memory: Read and Write Operations, Types of Memories; Read Only Memory, Programmable Logic Devices: PROM, PLA, PAL.

## TEXT BOOK:

1. M. Morris Mano, Michael D. Ciletti, "Digital Design", 5th Edition,Prentice Hall, 2013.
2. A.Anand Kumar, "fundamentals of digital circuits", 4th Edition, PHI.

## REFERENCE BOOKS:

1. John F. Wakerly, "Digital Design: Principles and Practices", 4th Edition, Pearson, 2006.
2. Brian Holdsworth , Clive Woods, "Digital Logic Design", 4th Edition, Elsevier Publisher, 2002.
3. Donald E Givone, "digital principles and design", TMT.

Communicative English
18EL001

Lectures:3 Periods/Week
Sem End Exam Duration: 3 hours

Continuous Assessment: 50M
Sem End Exam : 50M

**Credits: 2**

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UNIT-I

1.1 **Vocabulary Development**: Word formation-Formation of Nouns, Verbs & Adjectives from Root words-Suffixes and Prefixes
1.2 **Essential Grammar:** Prepositions, Conjunctions, Articles
1.3 **Basic Writing Skills**: Punctuation in writing
1.4 **Writing Practices**: Mind Mapping, Paragraph writing (structure-Descriptive, Narrative, Expository & Persuasive)

UNIT-II

2.1 **Vocabulary Development**: Synonyms and Antonyms
2.2 **Essential Grammar**: Concord, Modal Verbs, Common Errors
2.3 **Basic Writing Skills**: Using Phrases and clauses
2.4 **Writing Practices**: Hint Development, Essay Writing

Unit III

3.1 **Vocabulary Development**: One word Substitutes
3.2 **Essential Grammar**: Tenses, Voices
3.3 **Basic Writing Skills**: Sentence structures (Simple, Complex, Compound)
3.4 **Writing Practices**: Note Making

Unit IV

4.1 **Vocabulary Development**: Words often confused
4.2 **Essential Grammar**: Reported speech, Common Errors
4.3 **Basic Writing Skills**: Coherence in Writing: Jumbled Sentences
4.4 **Writing Practices**: Paraphrasing &Summarising

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Reference Books


- Communication Skills, Sanjay Kumar &PushpaLatha. Oxford University Press:2011.
- Practical English Usage, Michael Swan. Oxford University Press:1995.
- Remedial English Grammar, F.T.Wood. Macmillan:2007.
- Study Writing, Liz Hamplyons& Ben Heasley. Cambridge University Press:2006

**PROBLEM SOLVING USING PROGRAMMING**

(Common for all branches except Civil Engineering)

I B.Tech – II Semester (Code:18CS001)

| Lectures | 4 | Tutorial | 0 | Practical | 0 | Credits | 3 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Examination (3 Hours) | : | 50 | | |

**Prerequisites: BASIC MATHEMATICS**

**Course Objectives:** Students will be able to

1. Understand basic concepts of C Programming such as: C-tokens, Operators, Input/output, and Arithmetic rules.
2. Develop problem-solving skills to translate 'English' described problems into programs written using C language.
3. Use Conditional Branching, Looping, and Functions.
4. Apply pointers for parameter passing, referencing and differencing and linking data structures.
5. Manipulate variables and types to change the problem state, including numeric, character, array and pointer types, as well as the use of structures and unions, File.

**Course Outcomes:**

After the course the students are expected to be able to

1. Choose the right data representation formats based on the requirements of the problem.
2. Analyse a given problem and develop an algorithm to solve the problem.
3. Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
4. Write the program on a computer, edit, compile, debug, correct, recompile and run it.
5. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

**UNIT I (17 Periods)**

Overview of C, Constants, Variables and Data Types, Operators and Expressions,Managing I/O Operations. Decision Making and Branching.

**Programming Exercises for Unit I:**C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic and logical errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, Programs using Scientific and Engineering formulae. Finding the largest of the three given numbers.Computation of discount amount on different types of products with different

discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, finding given year is leap year or not, and conversion of lower case character to its upper case.

**UNIT II (17 Periods)**

Decision Making and Looping, Arrays, Character Arrays and Strings.

**Programming Exercises for Unit II:** To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence and to find prime factors of a given number.To print graphic patterns of symbols and numbers.To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not with and without using String Handling Functions. Transpose of a matrix and sorting of names using arrays.

**UNIT III (18 Periods)**

User-defined Functions,Structures and Unions,Pointers

**Programming Exercises for Unit - III:** Functions - Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic. Swapping two variable values. Sorting a list of student records on register number using array of pointers

**UNIT IV (18 Periods)**

File Management in C,Dynamic Memory Allocation,Preprocessor

**Programming Exercises for Unit - IV**: Operations on complex numbers, and to read an input file of marks and generate a result file, sorting a list of names using command line arguments. Copy the contents of one file to another file. Allocating memory to variables dynamically.

**Text Book:**

1. **Programming in ANSI C by E.Balaguruswamy,Fifth Edition.**

**References:**

1. Kernighan BW and Dennis Ritchie M, “C programming language”, 2nded, Prentice Hall.
2. Yashavant P. Kanetkar, “Let us C”, BPB Publications.
3. Herbert Schildt, “C: The Complete Reference”, 4th edition, Tata Mcgraw-Hill.
4. Ashok N.Kamthane, “Programming in C”, PEARSON 2nd Edition.

Physics Laboratory
I B.Tech– Semester (Code: 18PHL01 )
(COMMON TO ALL BRANCHES)

| Lectures | **0** | Tutorial | 0 | Practical | **3** | Credits | **1** |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | | | **50** | Semester End Examination (3hours) | | | **50** |

**LIST OF EXPERIMENTS**

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gee's appa□atus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Dete□□i□atio□ of □adius of □u□□atu□e of a Pla□o □o□□e□ le□s □□fo□□i□g Ne□to□'s □i□gs.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si &Ge.
15. Determination of wavelength of laser source using Diode laser.

**Any three experiments are virtual**

**TEXT BOOK**:

1. □Engineering physics laboratory manual□P.Srinivasarao&K.Muralidhar,Himalaya publications.

**English Communication Skills Laboratory**

18ELL01

Lectures:3 Periods/Week | Continuous Assessment: 50M

Sem End Exam Duration: 3 hours | Sem End Exam : 50M

**Credits: 1**

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**UNIT-I**

1.1 Listening Skills; Importance – Purpose- Process- Types
1.2 Barriers to Listening
1.3 Strategies for Effective Listening

**UNIT-II**

2.1 Phonetics; Introduction to Consonant, Vowel and Diphthong sounds
2.2 Stress
2.3 Rhythm
2.4 Intonation

**UNIT-III**

3.1 Formal and Informal Situations
3.2 Expressions used in different situations
3.3 Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing- Convincing People- Complaining & Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits

**UNIT-IV**

4.1 JAM Session
4.2 Debates
4.3 Extempore

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**Reference Books:**


- Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
- Better English Pronunciation, J.D. O' Connor. Cambridge University Press:1984
- New Interchange (4rth Edition), Jack C Richards. Cambridge University Press:2015
- English Conversation Practice, Grant Taylor. McGraw Hill:2001


**Software:**

- Buzzers for conversations, New Interchange series
- English in Mind series, Telephoning in English
- Speech Solutions, A Course in Listening and Speaking

**Problem Solving using Programming(Lab)**

I B.Tech – II Semester (Code: 18CSL01)

| Lectures | 0 | Tutorial | 0 | Practical | 3 | Credits | 1 |
|---|---|---|---|---|---|---|---|
| Continuous Internal Assessment | : | 50 | Semester End Lab Examination (3 Hours) | | | : | 50 |

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if-elsestatement).

| **Domestic Customer:** | | |
|---|---|---|
| **Consumption Units** | **Rate of Charges(Rs.)** | |
| 0 – 200 | 0.50 per unit | |
| 201 – 400 | 100 plus | 0.65 per unit |
| 401 – 600 | 230 plus | 0.80 per unit |
| 601 and above | 390 plus | 1.00 per unit |
| **Commercial Customer:** | | |
| **Consumption Units** | **Rate of Charges(Rs.)** | |
| 0 – 100 | 0.50 per unit | |
| 101 – 200 | 50 plus | 0.6 per unit |
| 201 – 300 | 100 plus | 0.70 per unit |
| 301 and above | 200 plus | 1.00 per unit |

2. Write a C program to evaluate the following (usingloops):
   a) $1 + x^2/2! + x^4 / 4!+$ …upto tenterms
   b) $x + x^3/3! + x^5/5!+$ … upto ten terms
3. Write a C program to check whether the given numberis
   a) Prime ornot.
   b) Perfect or Abundant orDeficient.
4. Write a C program to display statistical parameters (using one – dimensionalarray).
   a) Mean
   b) Mode
   c) Median
   d) Variance.
5. WriteaCprogramtoreadalistofnumbersandperformthefollowingoperations
   a) Print thelist.
   b) Delete duplicates from thelist.
   c) Reverse thelist.
6. Write a C program to read a list of numbers and search for a given number using Binary search algorithm and if found display its index otherwise display the message “Element not found in theList”.

7. Write a C program to read two matrices and compute their sum andproduct.

8.Write a C program to read list of student names and perform the following operations

a) To print the list of names.

b) To sort them in ascending order.

c) To print the list after sorting.

9. Write a C program that consists of recursive functions to

a) Find factorial of a given number

b) Solve towers of Hanoi with three towers ( A, B & C) and three disks initially on tower A.

10. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author, and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and request for the number of copies required ,if the requested copies are available the total cost of the requested copies is displayed otherwise the message “required copies not in stock” is displayed. Write a program for the above in structures with suitable functions.

11. Write a C program to read a data file of students’ records with fields( Regno, Name, M1,M2,M3,M4,M5) and write the successful students data (percentage > 40% ) to a data file.

12. Write a C program to read a file as command line argument and count the given word frequency in a file