INSTITUTE OF SCIENCE & TECHNOLOGY

ASSIGNMENT QUESTIONS FOR ODD SEM 2025

B.TECH- 1ST SEM-CSE - THEORY

PAPER NAME: PHYSICS-I
PAPER CODE: BS-PH-101

1. What are vectors? Describe different types of vectors.
2. Explain the basic ideas of partial differential equations.
3. What is potential energy function? Explain its physical significance.
4. What are conservative and non-conservative forces? Explain.
5. Describe the laws of conservation of energy and momentum.
6. Explain Fraunhofer diffraction at single slit, double slit, and multiple slits (only expressions for max; min, & intensity and qualitative discussion of fringes).
7. Describe Principles and Working of LASER.
8. Explain Plane Polarized Light.

PAPER NAME:MATHEMATICS
PAPER CODE: BS-M-101

1. Find the sum & product of the eigen values of the matrix $A=\begin{bmatrix}2 & 1 & 2\\ 1 & 3 & 1\\ 2 & 1 & -6\end{bmatrix}$

2. If $A=\begin{bmatrix}4 & 2 & 2\\ 2 & 4 & 2\\ 2 & 2 & 4\end{bmatrix}$, show that $A^2 - 10A + 16.I_3 = 0$. Hence, obtain A^{-1}.

3. Find Determine the rank of the matrix $A=\begin{bmatrix}1 & 0 & 3\\ 4 & -1 & 5\\ 2 & 0 & 6\end{bmatrix}$

4. Prove that the intersection of two subspace of a vector space V over a field F is a subspace of V.
5. Find the basis and dimension of the subspace W of R^3,where $W=\{(x,y,z)\in R^3 : x+2y+z=0, 2x+y+3z=0\}$.
6. Prove that the set $S=\{(0,11), (1,0,1), (1,1,0)\}$ is a basis of R^3.

PAPER NAME: BASIC ELECTRICAL ENGINEERING
PAPER CODE: ES-EE-101

1. What are continuous and discrete functions? What are Fixed and Time varying Functions?
2. Explain the terms lumped and distributed networks. What are passive and active networks?
3. What are independent and dependent sources?
4. What do you understand by Step, Ramp, Sinusoidal and Square functions?
5. Explain the concept of Tree, Branch and Tree link.
6. Explain in detail the term Magnetic Coupling? What do you understand by polarity of coils?

B.TECH – 1ST SEM-CSE – PRACTICAL

PAPER NAME:PHYSICS-I LAB
PAPER CODE: BS-PH-191

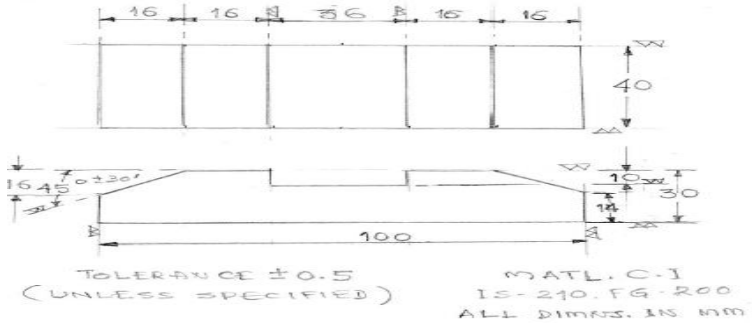
1. Describe the dispersive power of the material of a prism.
2. Discuss about the procedure to determine the wavelength of a monochromatic light by Newton's ring.
3. Explain about Rydberg constant by studying hydrogen spectrum.

PAPER NAME: BASIC ELECTRICAL ENGINEERING LAB
PAPER CODE: ES-EE- 191

1. Determination of operating characteristics of Synchronous generator (alternator).
2. Determination of resonance frequency and quality factor of series R-L-C circuit.
3. Determination of Torque –Speed characteristics of separately excited DC motor.
4. Measurement of power in a three phase unbalanced circuit by two wattmeter method.

PAPER NAME: WORKSHOP PRACTICE
PAPER CODE: ES-ME-192

1. What are common materials used for pattern making? Discuss advantages and disadvantages of wooden pattern.
2. Sketch a single point V-tool for turning operation & elaborate geometry of the said tool (HSS).
3. Differentiate between the following –
   i. Tapping and Dieing
   ii. Drilling & reaming
   iii. Counter sinking & counter boring.
4. Make pattern (wooden) for Guide block for sketch considering machining allowance on each side & others (shrinkage, contraction, draft angle) where ever necessary.



B.TECH-3RD SEM-CE-THEORY

PAPER NAME: BIOLOGY FOR ENGINEERS
PAPER CODE :CE-BS 301

1. Write the difference between human eye & camera.
2. What is model organism? Explain the use of frui fly &E.coli as model organism.
3. Explain the process of glycolysis.

4. Write a short note on first and second law of thermodynamics.
5. Discuss two mechanism of enzyme action.

PAPER NAME: ENERGY SCIENCE & ENGINEERING
PAPER CODE: CE(ES)302

1. a) Discuss the role of energy science in addressing climate change and environmental challenges.
   b) With examples, explain the concept of energy systems and resources.
   c) A country consumes 300 million tonnes of oil equivalent (MTOE) annually. If 1 MTOE = 11.63 TWh, calculate the annual energy consumption in TWh and PJ (1 TWh = 3600 PJ).
2. a) Explain the advantages and limitations of fossil fuels as an energy source.
   b) Discuss the sustainability and environmental trade-offs of biomass, wind, and solar energy systems.
   c) A pumped storage hydropower plant lifts 2×10^6 m^3 of water through a height of 350 m. Assuming efficiency = 80%, calculate the amount of energy stored (in MWh).
3. a) Define carbon footprint and explain its significance in sustainable energy management.
   b) Write short notes on energy efficiency, conservation, and clean energy technologies.
   c) A household consumes 500 kWh/month of electricity. If the CO_2 emission factor is 0.85 kg/kWh, calculate the monthly and annual carbon footprint of the household.
4. a) Describe the civil engineering projects associated with tidal power and wind energy systems.
   b) Explain the design and safety considerations of a nuclear reactor containment building.
   c) A hydropower station generates 400 MW at an efficiency of 90%. If the available head is 100 m, calculate the discharge (m^3/s) required for the plant. (Take g = 9.81 m/s^2).
5. a) What is Green Building? Discuss the role of LEED ratings in sustainable construction.
   b) Explain the concept of embodied energy analysis and its importance in measuring sustainability.
   c) An industry conducts an energy audit and finds that its monthly energy consumption is 120,000 kWh. By implementing optimization measures, it reduces consumption by 15%. Calculate the annual energy savings in kWh and the reduction in CO_2 emissions (take 0.82 kg/kWh).

PAPER NAME: ENGINEERING MECHANICS
PAPER CODE: CE(ES)301

1. a) Explain the concept of free body diagram (FBD) with suitable examples.
   b) A uniform beam of length 6 m and weight 300 N is supported at its ends. A load of 600 N is applied at a distance of 2 m from the left support. Draw the FBD and determine the reactions at the supports.
   c) Discuss the concept of static indeterminacy with one practical example.
2. a) State the laws of friction and explain the difference between static and dynamic friction.
   b) A body weighing 1000 N rests on a rough horizontal plane. The coefficient of friction between the body and the surface is 0.3. Find the horizontal force required to just move the body.
   c) Explain the working of a screw jack with the help of neat sketches and derive its mechanical advantage.
3. a) Differentiate between Method of Joints and Method of Sections in truss analysis.
   b) For the truss shown below (a simple triangular truss with load P applied at the top joint), determine the forces in all members and state whether they are in tension or compression.
   c) What are zero force members in a truss? State the conditions under which they occur.
4. a) Define centroid and centre of gravity. Explain their engineering significance.
   b) Find the centroid of a composite section consisting of a rectangle (200 mm × 100 mm) with a semicircle

of radius 50 mm attached on its top.

c) State and prove the parallel axis theorem for moment of inertia.

5. a) Explain the difference between free vibrations and forced vibrations with examples.

   b) A simple pendulum of length 1.2 m is displaced and released. Determine its natural frequency and time period of oscillation. (Take g = 9.81 m/s^2).

   c) Define resonance and explain its harmful effects in engineering structures.

PAPER NAME: HUMANITIES-I (Effective Technical Communication)
PAPER CODE: CE(HS)301

1. State different kinds of technical documents.
2. What are the barriers of Effective Technical Communication?
3. Mention the advantages and disadvantages of formal communication.
4. What are the advantages of single sourcing?
5. Write in brief the methods, style and types of communication.
6. Write short notes on: i) Manuals ii) Official note
7. What are the importance and steps of attitude?
8. Mention the major E-mail etiquettes in social and official settings.

PAPER NAME: INTRODUCTION TO CIVIL ENGINEERING
PAPER CODE: CE(HS)302

1. a) Define Civil Engineering and explain its importance in nation-building. Discuss at least five broad disciplines of Civil Engineering with examples of their applications.

   b) Prepare a matrix/table showing Civil Engineering disciplines (e.g., Structural, Geotechnical, Transportation, Environmental, etc.) and possible career roles for engineers in each.
2. a) Identify and describe five ancient monuments and five modern marvels of Civil Engineering. Highlight the unique features of each.

   b) Explain how the development of construction materials (stone, brick, concrete, steel, composites) has influenced Civil Engineering practices over history.
3. a) Explain the fundamentals of Architectural design & Town Planning. Discuss the role of aesthetics in Civil Engineering projects with suitable examples.

   b) Identify five Civil Engineering projects with high aesthetic appeal and justify one key factor that makes each aesthetically remarkable.

   c) For a Smart City project, list and describe at least five engineering systems (e.g., HVAC, acoustics, lighting, transport, water supply) that must be integrated, and prepare a simple block diagram showing their interconnections.
4. a) Discuss the importance of Construction Management & Contracts Management in Civil Engineering. Explain briefly the concepts of Lean Construction and Automation in Construction.

   b) Identify five modern construction methods (e.g., prefabrication, slip form, modular construction, 3D printing, robotic construction) and list one positive feature of each.

   c) A high-rise project requires excavation of 15,000 m^3 soil. If one excavator has a capacity of 1.2 m^3 per cycle and operates at 75% efficiency with 18 cycles/hour, estimate the total time required in hours for the excavation.
5. a) Explain the concept of sustainability in construction and discuss the role of Civil Engineers in achieving a sustainable built environment.

b) Briefly describe three modern green building materials and their potential in reducing environmental impacts.

c) A residential complex consumes 1,20,000 kWh of electricity annually. If a solar plant with 15% efficiency is installed on its rooftop of area 2,000 m², with an average solar radiation of 5 kWh/m²/day, estimate the approximate annual power generation. Discuss if it is sufficient to meet the demand.

PAPER NAME: MATHEMATICS-III
PAPER CODE: CE(BS)302

1. The Laplace transform of f(t) = sin t is L{sin t} = 1/(s^2 + 1).
   Find the Z–transform of $2n + 3\sin\frac{n\pi}{4} - 5a^4$
2. Prove that in a tree there is one and only one path between every pair of vertices.
3. Describe Prims algorithm.
4. Prove that a simple graph with n number of vertices and k number of components can have maximum $\frac{(n-k)(n-k+1)}{2}$ number of edges.
5. Let S={a,b,c,d} and P={(a,a),(b,b),(c,c),(d,d),(a,b),(b,a),(b,c),(c,b)}. Show that the relation P is reflexive and symmetric but not transitive.

B.TECH-3RD SEM-CE-PRACTICAL

PAPER NAME: BASIC ELECTRONICS
PAPER CODE: CE(ES)391

1. Common-base bipolar transistor characteristics.
2. Characteristics of photo transistor.
3. To verify the truth tables for all logic Gates – NOT, OR ,AND, NAND, NOR ,XOR and XNOR
4. Implement and realize Boolean Expressions with different Logic Gates.
5. Implement Half Adder, Full Adder, Half Sub tractor and Full sub tractor by using different digital ICs

PAPER NAME: COMPUTER AIDED CIVIL ENGG. DRAWING
PAPER CODE: CE(ES)392

1. What is CAD, and why is it important in engineering design?
2. What is the difference between 2D CAD and 3D CAD?
3. What is the purpose of layers in CAD software?
4. What are the primary advantages of using CAD over traditional manual drafting?
5. How do you ensure that a CAD design is accurate and precise?

PAPER NAME: LIFE SCIENCE
PAPER CODE: CE(ES)393

1. Describe the process of mitosis and its phases.
2. How does the parasitic strategy of a tapeworm benefit its survival?
3. What is the relationship between preserving biodiversity and sustainability?
4. How do I study the presence of microorganisms in everyday life?
5. What is DNA?

B.TECH-3RD SEM-ME-THEORY

PAPER NAME: BIOLOGY
PAPER CODE: BS-BIO301

1. Write the difference between human eye & camera.
2. What is model organism?Explain the use of frui fly &E.coli as model organism.
3. Explain the process of glycolysis.
4. Write a short note on first and second law of thermodynamics.
5. Discuss two mechanism of enzyme action.

PAPER NAME: MATHEMATICS-III
PAPER CODE: BS-M301

1. Two urns contain respectively 5 white, 7 black balls, and 4 white and 2 black balls. One of the urns is selected by the toss of a fair coin and then 2 balls are drawn without replacement from the selected urn. If both balls drawn are white, what is the probability that the first urn is selected?
2. Suppose box A contains 4 green and 5 black coins and box B contains 6 green and 3 black coins. A coin is chosen at random from the box A and placed in box B. Finally, a coin is chosen at random from among those now in box B. What is the probability a blue coin was transferred from box A to box B given that the coin chosen from box B is green?.
3. The chance that a doctor will diagnose a certain disease correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of the doctor who had the disease dies. What is the probability that the disease was diagnosed correctly?
4. A speaks the truth 8 times out of 10 times. A die is thrown. He speaks that it was 5. What is the probability that it was actually 5?
5. Slove $(D^2+4)y = \sin x$.
6. Solve$(x^2\, y - 2xy^2)dx + (3\, x^2\, y - x^3)dy = 0$. .

PAPER NAME: BASIC ELECTRONICS ENGINEERING
PAPER CODE: ES-ECE 301

1. What are the characteristics of a Diode? Draw the graph of V-I Characteristics of it.
2. What are the advantages & Disadvantages of a Half wave Rectifier over Full wave?
3. Explain how a Diode can be used as a switch?
4. What is capacitor Filter Circuit? Explain about BJT & JFET
5. Draw and Explain the operation of a SCR. What are the characteristics of various Modulation Techniques?

PAPER NAME: ENGINEERING MECHANICS
PAPER CODE: ES-ME 301

1. Define & explain perpendicular axes theorem.
2. Determine the horizontal force P to be applied to a block weighing 2000N to hold it in position, the inclined plane is smooth & makes $60^0$with the horizontal .
3. State and prove varignon's theorem.
4. Describe the wedge friction & Angle of repose.

PAPER NAME: MANUFACTURING PROCESSES
PAPER CODE: PC-ME 302

1. Describe the various kinds of patterns in use. What are the allowances provided, when making a pattern? How does the pattern differ from casting required?
2. Explain various types of casting defects.
3. Explain various types of milling operation.
4. Explain various types of lathe operation
5. What do you mean by case-hardening? Explain different methods of case hardening in detail.
6. Explain with neat sketch, basic working principle of rolling. Describe its applications in industry.
7. Explain various resistance welding process.
8. Draw a neat sketch and explain metal Extrusion process. Give the example of four extruded products. What are different types of extrusion? Explain.
9. What is forging? Classify the different methods of forging.

PAPER NAME: THERMODYNAMICS
PAPER CODE: PC-ME 301

1. Explain the three modes of heat transfer with suitable examples. Derive the general heat balance equation and obtain the steady one-dimensional conduction equation in Cartesian coordinates.
2. Derive the steady one-dimensional conduction equation in cylindrical and spherical coordinates. State the assumptions clearly.
3. What do you mean by conduction and film resistances? Derive the expression for critical insulation thickness for a cylindrical wire and explain its significance.
4. Discuss the lumped system approximation. Define the Biot number and explain its physical significance. Under what condition is the lumped system analysis applicable?
5. Derive the temperature distribution and heat transfer expression for a straight fin (pin fin) of uniform cross-section. Discuss the different cases:
   (a) Very long fin
   (b) Fin with insulated tip
6. Explain the concept of two-dimensional conduction. Discuss the methods of solution for steady and unsteady conduction problems. Explain how Heisler charts are used for approximate solutions to unsteady conduction problems.
7. Write down the basic equations of heat convection. Explain the concept of hydrodynamic and thermal boundary layers for both internal and external flows.
8. Differentiate between forced convection and natural convection. How are heat transfer rates estimated in laminar and turbulent flows using appropriate correlations? Give examples.

B.TECH-3RD SEM-ME-PRACTICAL
PAPER NAME: PRACTICE OF MANUFACTURING PROCESSES LABORATORY
PAPER CODE: PC-ME 391

1. Pattern Making: 1 or 2 wooden patterns to make- 2 modules
2. Moulding: 1 module
3. Smithy Shop: 1 module

B.TECH-3RD SEM-EE-THEORY

PAPER NAME: BIOLOGY FOR ENGINEERS
PAPER CODE: BS-EE301

1. Write the difference between human eye & camera.
2. What is model organism?Explain the use of frui fly &E.coli as model organism.
3. Explain the process of glycolysis.
4. Write a short note on first and second law of thermodynamics.
5. Discuss two mechanism of enzyme action.

PAPER NAME: MATHEMATICS-III
PAPER CODE: BS-M 301

1. Two urns contain respectively 5 white, 7 black balls, and 4 white and 2 black balls. One of the urns is selected by the toss of a fair coin and then 2 balls are drawn without replacement from the selected urn. If both balls drawn are white, what is the probability that the first urn is selected?
2. Suppose box A contains 4 green and 5 black coins and box B contains 6 green and 3 black coins. A coin is chosen at random from the box A and placed in box B. Finally, a coin is chosen at random from among those now in box B. What is the probability a blue coin was transferred from box A to box B given that the coin chosen from box B is green?.
3. The chance that a doctor will diagnose a certain disease correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of the doctor who had the disease dies. What is the probability that the disease was diagnosed correctly?
4. Evaluate $\int_0^1 \sqrt{1-x^3}$ dx by Trapizoidal rule ,taking six equal intervals ,correct up to two decimal places.
5. Evaluate $\int_0^{\pi|2} \sqrt{sinx}$ dx by simpson's one third rule ,taking six equal intervals ,correct up to four significant figures
6. prove that $p(B/A) \geq 1 - \frac{P(B)}{P(A)}$ in general .

PAPER NAME: ENGINEERING MECHANICS
PAPER CODE: ES-ME 301

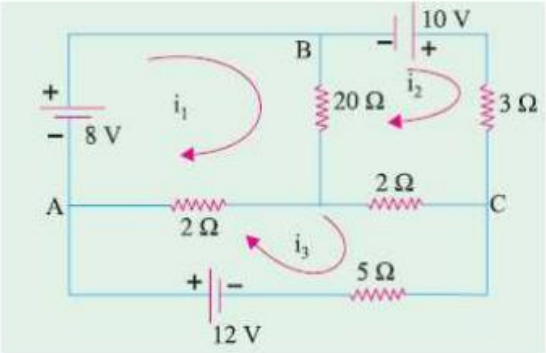
1. A force given by F = 3i +2j-4k is applied at the point P(1,-1,2). Find the moment of the Force F about the point O(2,-1,3) & about origin.
1. Define & explain perpendicular axes theorem.
2. Determine the horizontal force P to be applied to a block weighing 2000N to hold it in position, the inclined plane is smooth & makes $60^0$with the horizontal .
3. State and prove varignon's theorem.
4. Describe the wedge friction & Angle of repose.
5. A body resting on a rough horizontal plane, required a pull of 200N inclined at $30^0$to the plane just to move it.It was found that a push of 250 N inclined at 30^0 to the plane just to move it. Determine the weight of the body & the co-efficient of friction.

PAPER NAME: INDIAN CONSTITUTION
PAPER CODE: MC-EE 301

1. Describe the Directive Principles of State Policy.
2. Discuss about the Central – State govt. relationship.
3. Describe the power & function of Prime Minister as per Indian Constitution.
4. Discuss the role & functions of the Mayor.
5. Write a short note on – Public Interest Litigation(PIL).

PAPER NAME: ELECTRIC CIRCUIT THEORY
PAPER CODE: PC-EE 301

1. State Sate superposition theorem. Explain it.
2. Write some applications of maximum power transfer theorem..
3. State Norton's Theorem. Explain it.
4. Define Apparent power and Power factor.
5. **Determine current in 5ohm resistor by any one method.**



PAPER NAME: ANALOG ELECTRONICS
PAPER CODE: PC-EE 302

1. Explain the differences between Semiconductor and Diode.
2. What are the characteristics of an IC? What is FET? Give its classification.
3. What is P-Channel MOSFET? Explain briefly.
4. Write shot notes on: Photolithography
5. What is Amplifier? Explain briefly.

PAPER NAME: ELECTROMAGNETIC FIELD THEORY
PAPER CODE: PC-EE 303

1. Explain the coordinate system and their transformation in circular cylindrical coordinate system.
2. Describe the coordinate system and their transformation spherical coordinate system?
3. Explain the terms Gradient and Divergence of a vector?
4. What is curl of a vector? State and prove Stoke's theorem.

5. Explain in detail Coulomb's law in Electrostatics.
6. Derive Gauss Law in electrostatics. How is it related to Maxwell's Equations?
7. Explain Biot-Savart law in Magneto statics? What is Ampere's circuital law?
8. Describe the Magnetic Flux Density.

B.TECH-3RD SEM-EE-PRACTICAL

PAPER NAME: NUMERICAL METHODS LABORATORY
PAPER CODE: PC-CS 391

1. Find the $\sqrt{17}$ using Newton Raphson method.
2. Find the root of the equation 3x = 1+cosx using bisection method.
3. Find the root of the equation 2x-logx10 = 7 using Iteration method.
4. Show that Real parts of an analytic function satisfies Laplace equation.
5. Write a formula for trapezoidal rule.

PAPER NAME: ELECTRIC CIRCUIT THEORY LABORATORY
PAPER CODE: PC-EE 391

1. Verification of super position theorem using hard ware and digital simulation.
2. Verification of maximum power transfer theorem using hardware and digital simulation.
3. Verification of Thevenin's theorem using hard ware and digital simulation.
4. Verification of series resonance using hard ware and digital simulation.

PAPER NAME: ANALOG ELECTRONICS LABORATORY
PAPER CODE: PC-EE 392

1. Study of characteristics curves of F.E.T & B.J.T
2. study the class A,C & push-pull Power amplifier
3. Construction of a simple Function Generator using IC
4. Study of DAC
5. Study of timer circuit using NE555 & Configuration for monostable & astablemultivibrator.

B.TECH-3RD SEM-CSE-THEORY

PAPER NAME: MATHEMATICS-III
PAPER CODE: BSC 301

1. If $u = \tan^{-1}\left(\frac{x^{5/2}+y^{5/2}}{\sqrt{x}-\sqrt{y}}\right)$ show that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y} = sin2u$
2. Solve the Cauchy's Linear Differential Equation:

$$x^3\frac{d^3y}{dx^3} + 3x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + 8y = 13\cos(\log x),\ x > 0$$

3. Show that a bipartite graph cannot contain an odd cycle.
4. Discuss the convergence of the power series:

$$1 + \frac{3}{7}x + \frac{3\cdot 6}{7\cdot 10}x^2 + \frac{3\cdot 6\cdot 9}{7\cdot 10\cdot 13}x^3 + \cdots \quad (x > 0)$$

5. Show that $\vec{F} = (6xy + z^3)\hat{\imath} + (3x^2 - z)\hat{\jmath} + (3xz^2 - y)\hat{k}$ is irrotational. Find a scalar function φ such that $\vec{F} = \vec{\nabla}\varphi$.

PAPER NAME: ANALOG & DIGITAL ELECTRONICS
PAPER CODE: ECS 301

1. Explain the terms Feedback and Oscillation.
2. Explain the working of various multivibrators.
3. What are the operations & applications of Schmitt trigger circuits.
4. Explain the Basic Concepts of A/D AND D/A conversion.
5. What are the operating principle of R-2R Ladder DAC

PAPER NAME: ECONOMICS FOR ENGINEERS (Humanities-II)
PAPER CODE: HSMC 301

1. Define Engineering Economics. Explain its scope and importance in decision-making for engineers.
2. A manufacturing company has fixed costs of Rs. 50,000 and variable cost of Rs. 200 per unit. If the selling price per unit is Rs. 500, calculate the breakeven point (BEP) in units and in sales value.
3. Explain the concept of time value of money. How is it applied in engineering project evaluation? Give an example using Present Value (PV) and Future Value (FV).
4. What is depreciation? Explain any two methods of calculating depreciation with suitable examples.
5. What is cost-benefit analysis? Discuss its significance in evaluating engineering projects with an example.
6. Explain the effects of inflation on engineering economics. How should engineers adjust project costs in an inflationary economy?

PAPER NAME: DATA STRUCTURE & ALGORITHM
PAPER CODE:PCC-CS301

1. Explain different data structure operations such as insertion, deletion, traversal with examples.
2. Discuss applications of stacks in expression conversion(infix to postfix/prefix) with algorithm.
3. Explain how stacks and queues can be implemented using linked lists.
4. Explain insertion and rotation operations in an AVL tree with examples.
5. Explain B+ Tree with structure and algorithms. Compare it with B-Tree.

PAPER NAME:COMPUTER ORGANISATION
PAPER CODE:PCC-CS302

1. Explain the role of operating systems in program execution.
2. Explain the role of compiler and assembler in program execution.
3. Describe the fetch-decode-execute cycle with diagram.

4. Define operator, operand, register, and storage with examples.
5. Discuss commonly used number systems (binary, octal, decimal, hexadecimal) with conversions.

B.TECH-3RD SEM-CSE-PRACTICAL

PAPER NAME:ANALOG & DIGITAL ELECTRONICS LAB
PAPER CODE:ESC 391

1. Designofclass apoweramplifier.
2. Construction a decoder & multiplexercircuitusingbasic gates.
3. Realizationofofflip-flops:(i)rs-type(ii)d-type (iii)jk-type.
4. Mod-ncounterdesign.
5. Realization of synchronous up/downcounter.

PAPER NAME:DATA STRUCTURE & ALGORITHM LAB
PAPER CODE:PCC-CS391

1. Write a program to create, insert, delete, and traverse an array.
2. Write a program to evaluate a postfix expression using a stack.
3. Implement a function to reverse (invert) a linked list.
4. Implement threaded binary tree traversal.
5. Write a program to search, insert, and delete elements in a hash table.

PAPER NAME: COMPUTER ORGANISATION
PAPER CODE: PCC-CS392

1. Design and implement a half adder using basic logic gates.
2. Design and implement a full adder using basic logic gates.
3. Design an Adder/Subtractor composite unit using logic gates.
4. Design and implement a 4-bit BCD Adder circuit.
5. Design and implement a Carry Look-Ahead Adder and verify operation.

PAPER NAME: IT-WORKSHOP
PAPER CODE: PCC-CS-393

1. Write a program to swap two numbers using a temporary variable and without using a temporary variable.
2. Write a program to count the number of vowels in a given string.
3. Write a program to find the largest and smallest element in a list.
4. Write a program to find the factorial of a number using a function.
5. Write a program to calculate the sum of digits of a number using while loop.

B.TECH-3RD SEM-ECE-THEORY

PAPER NAME: MATHEMATICS-III
PAPER CODE: BS-M301

1. Solve the system of equations, by Gauss – elimination method

$$2x_1 + 3x_2 + x_3 = 9$$
$$x_1 + 2x_2 + 3x_3 = 6$$
$$3x_1 + x_2 + 2x_3 = 8$$

2. Solve the following system of equations:

$$x + y + z = 2$$
$$x + 2y + 3z = 5$$
$$2x + 3y + 4z = 11$$

3. Find Fourier sine transform of e^{-ax}/x
4. Find the Fourier cosine transform of the function $3e^{-5x} + 5e^{-2x}$.
5. Find the Fourier cosine transform of f(x) = x.
6. Solve the system of equations using the Gauss-Seidel Method

$$45x_1 + 2x_2 + 3x_3 = 58$$
$$-3x_1 + 22x_2 + 2x_3 = 47$$
$$5x_1 + x_2 + 20x_3 = 67$$

PAPER NAME: ELECTRONIC DEVICES
PAPER CODE: EC301

1. What are theenergy bands & current carriers in semiconductors**?**
2. States the different Breakdown mechanisms &Photovoltaic effects
3. Describe different components of Forward biased junction diode.
4. What are the fundamental features of Zener diodes?
5. Explain the Optical absorption in semiconductors

PAPER NAME: DIGITAL SYSTEM DESIGN
PAPER CODE: EC302

6. What are the MSI Devices & SOP & POS Forms and Canonical Forms?
7. States the different Sequential Logic Design
8. Describe different Logic Families and Semiconductor Memories.
9. Briefly discuss the VLSI Design Flow
10. Explain the Different Types of A/D and D/A Conversion Techniques & Sample and Hold Circuit.

PAPER NAME: SIGNALS & SYSTEMS
PAPER CODE: EC303

1. Briefly Explain the Signals and Systems in Everyday Life and Engineering
2. States the Linear Shift-Invariant (LSI) Systems

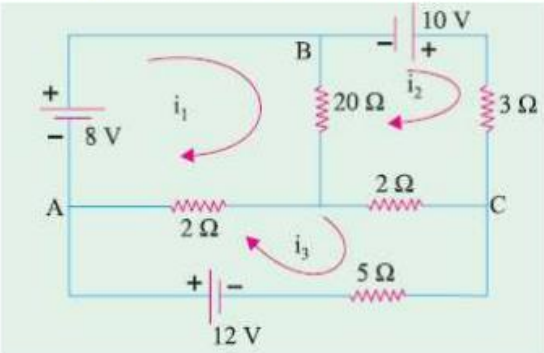
3. Describe different Periodic and Semi-Periodic Inputs to LSI Systems
4. Briefly discuss the Fourier Transform & Laplace Transform
5. Explain the Sampling Theorem. What is aliasing?

PAPER NAME: NETWORK THEORY
PAPER CODE: EC304

1. State Sate superposition theorem. Explain it.
2. Write some applications of maximum power transfer theorem..
3. State Norton's Theorem. Explain it.
4. Define Apparent power and Power factor.

5.

Determine current in 5ohm resistor by any one method.



PAPER NAME: DATA STRUCTURE &ALGORITHM(ES)
PAPER CODE: PCC-CS301

1. Explain different data structure operations such as insertion, deletion, traversal with examples.
2. Discuss applications of stacks in expression conversion (infix to postfix/prefix) with algorithm.
3. Explain how stacks and queues can be implemented using linked lists.
4. Explain insertion and rotation operations in an AVL tree with examples.
5. Explain B+ Tree with structure and algorithms. Compare it with B-Tree.

B.TECH-3RD SEM-ECE-PRACTICAL
PAPER NAME: ELECTRONICS DEVICES LAB
PAPER CODE: EC391

1. Study of different components like CRO, function generator, passive and active electronic components and regulated power supply, Multimeter etc.
2. Common-base bipolar transistor characteristics
3. Characteristics of Zener Diode as voltage regulator & calculate load regulation.
4. Characteristics of photo transistor

5. JFET characteristics(CS)

PAPER NAME: DIGITAL SYSTEM DESIGN LAB
PAPER CODE: EC392

1. Verification of the Truth Table of Logic Gates
2. Verification of State Tables of Flip-Flops: (i) RS-Type (ii) D- Type (iii) T- Type. (iv) JK-Type
3. Realization of asynchronous up/down counter

4. Implementation and Verification of Decoder/De-Multiplexer and Encoder using Logic Gates.
5. Implementation of 4x1 Multiplexer using Logic Gates.

PAPER NAME: DATA STRUCTURE LAB(ES)
PAPER CODE: PCC-CS391

1. Write a program to create, insert, delete, and traverse an array.
2. Write a program to evaluate a postfix expression using a stack.
3. Implement a function to reverse (invert) a linked list.
4. Implement threaded binary tree traversal.
5. Write a program to design a bank account management system.

PAPER NAME:ENVIRONMENTAL SCIENCE
PAPER CODE: MC381

1. How to create awareness to prevent pollution?
2. What is the effect of sound pollution?
3. How to reduce electricity waste?
4. What is biodegradable waste?
5. What is the segregation of waste?

B.TECH-3RD SEM-AEIE-THEORY
PAPER NAME: MATHEMATICS-III
PAPER CODE: BS-M301

1. A disease has prevalence 1% in a population. A diagnostic test has sensitivity 95% and specificity 90%. A person tests positive. What is the probability they actually have the disease?

2. Let $X_1, \ldots, X_{100}$ be iid Bernoulli$(p = 0.4)$. Let $S_{100} = \sum_{i=1}^{100} X_i$. Find $E[S_{100}]$, $\mathrm{Var}(S_{100})$

   And use Chebyshev's inequality to bound

$$P\left(\left|\frac{S_{100}}{100} - 0.4\right| > 0.1\right)$$

3. Find the inverse Laplace Transform of

$$F(s) = \frac{s+2}{s^2+4s+5}$$

4. USE Lagrange's Interpolation Formula to find the polynomial *P(x)* that passes through the points: (1,1),(2,4),(3,9),(4,16).
Use it to estimate *f(2.5)*.

5. Use the **Newton-Raphson Method** to find an approximate root of:

$$f(x) = \cos x - x$$

correct to **four decimal places**, starting with x_0=0.5.

PAPER NAME:ENVIRONMENTAL SCIENCE
PAPER CODE: MC-ES301

1. Write a short note on Grassland ecosystem.
2. Enumerate the concept of Environment destruction.
3. Discuss the causes and effects Ozone layer destruction.
4. What do you mean by Ecological balance?
5. What is sustainable Environmental development?

PAPER NAME: SENSORS AND TRANSDUCERS
PAPER CODE: PC-EI302

1. What are the Significance of Measurement and Instruments & also explain the Static & Dynamic Characteristics of Instruments?
2. States the different Resistive transducers
3. Describe the Applications of Strain Gauge in Load and Torque Measurement
4. Briefly discuss the Inductive transducers
5. Explain the Different Types of Micro-sensors &Capacitive transducers.

PAPER NAME: ANALOG INTEGRATED CIRCUIT
PAPER CODE: PC-EI303

1. What are the Biasing Circuits for BJT and FET?
2. States the different Feedback and oscillator circuits
3. Describe the small signal analysis of BJT
4. Briefly discuss about theIdeal Operational Amplifier (OPAMP)
5. Explain the Different Types of Instrumentation Amplifier and its Application

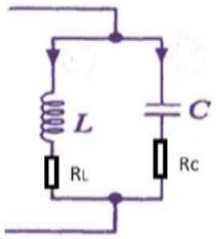
PAPER NAME:DIGITAL ELECTRONIC CIRCUITS
PAPER CODE: PC-EI304

1. What are the Digital Number System and Codes?
2. States the different Logic Operations and Gates & Boolean Algebra
3. Explain the Combinational and Arithmetic Logic Circuits
4. Briefly discuss the comparison about the **C**ombinational vs Sequential Circuits
5. Explain the Different Types of Memory and Programmable Logic Devices & Logic Families

PAPER NAME: NETWORK ANALYSIS
PAPER CODE: PC-EI301

1. Show that resonant frequency of series resonance circuit is equal to the geometric mean of two half power frequencies.

2. Derive the expression for the resonant frequency of the circuit shown in figure. Show that the circuit will resonate at all frequencies if $R_L=R_C=\sqrt{\frac{L}{C}}$



3. Obtain the Laplace transform of a full wave rectified sine wave of amplitude 1 and period π sec.

4. Draw a circuit diagram for the cable problem and derive Blavier's formula. Also, provide a formula for the leakage resistance in terms of R, R, and R.

5. Explain the concept of LOOP analysis.

B.TECH-3RD SEM-AEIE-PRACTICAL
PAPER NAME: CIRCUIT AND NETWORK LAB
PAPER CODE: PC-EI391

5. Verification of Kirchhoff's current law and voltage law using hard ware and digital simulation.
6. Verification of mesh analysis using hard ware and digital simulation.
7. Verification of nodal analysis using hard ware and digital simulation.
8. Determination of average value, rms value, form factor, peak factor of sinusoidal wave, square wave using hard ware and digital simulation.
9. Verification of super position theorem using hard ware and digital simulation..

PAPER NAME: SENSORS AND TRANSDUCERS LAB
PAPER CODE: PC-EI392

1. Displacementmeasurementbycapacitivetransducer
2. Studyof weight & torquemeasurementis usingstraingauge
3. Displacement measurement using LVDT
4. Study of a Load cell
5. CharacteristicsofLDR andstudyof IRsensor

PAPER NAME:ANALOG CIRCUITS DESIGN LAB
PAPER CODE: PC-EI393

1. Study of characteristics curves of F.E.T & B.J.T
2. Study the class A,B power amplifier
3. Study of class C & push-pull amplifiers
4. Realization of PLL using VCO & to measure the lock frequency
5. Study of DAC & ADC

PAPER NAME: DIGITAL CIRCUITS DESIGN LAB
PAPER CODE: PC-EI394

1. Realization of basic gates using universal gates
2. Construction of simple arithmetic circuits-Adder, Substractor
3. Realization of RS-JK & D flip-flops using universal logic gates
4. Construction of simple decoder & multiplexer using logic gates
5. Implementation of 4x1 multiplexer using logic gates

B.TECH-3RD SEM-EEE-THEORY
PAPER NAME: BIOLOGY FOR ENGINEERS
PAPER CODE: BS-EEE301

6. Write the difference between human eye & camera.
7. What is model organism? Explain the use of frui fly & E.coli as model organism.
8. Explain the process of glycolysis.
9. Write a short note on first and second law of thermodynamics.
10. Discuss two mechanism of enzyme action.

PAPER NAME: MATHEMATICS-III
PAPER CODE: BS-M 301

7. Two urns contain respectively 5 white, 7 black balls, and 4 white and 2 black balls. One of the urns is selected by the toss of a fair coin and then 2 balls are drawn without replacement from the selected urn. If both balls drawn are white, what is the probability that the first urn is selected?
8. Suppose box A contains 4 green and 5 black coins and box B contains 6 green and 3 black coins. A coin is chosen at random from the box A and placed in box B. Finally, a coin is chosen at random from among those now in box B. What is the probability a blue coin was transferred from box A to box B given that the coin chosen from box B is green?.
9. The chance that a doctor will diagnose a certain disease correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of the doctor who had the disease dies. What is the probability that the disease was diagnosed correctly?
10. Evaluate $\int_0^1 \sqrt{1-x^3}$ dx by Trapizoidal rule ,taking six equal intervals ,correct up to two decimal places.
11. Evaluate $\int_0^{\pi|2} \sqrt{sinx}$ dx by simpson's one third rule ,taking six equal intervals ,correct up to four significant figures

12. prove that $p(B/A) \geq 1 - \frac{P(B)}{P(A)}$ in general .

PAPER NAME: ENGINEERING MECHANICS
PAPER CODE: ES-ME 301

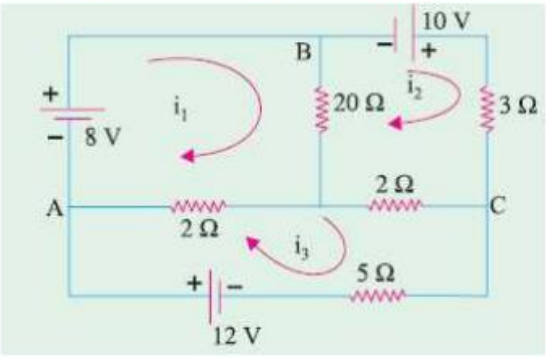
2. A force given by F = 3i +2j-4k is applied at the point P(1,-1,2). Find the moment of the Force F about the point O(2,-1,3) & about origin.
6. Define & explain perpendicular axes theorem.
7. Determine the horizontal force P to be applied to a block weighing 2000N to hold it in position, the inclined plane is smooth & makes $60^0$with the horizontal .
8. State and prove varignon's theorem.
9. Describe the wedge friction & Angle of repose.
10. A body resting on a rough horizontal plane, required a pull of 200N inclined at $30^0$to the plane just to move it.It was found that a push of 250 N inclined at 30^0 to the plane just to move it. Determine the weight of the body & the co-efficient of friction.

PAPER NAME: INDIAN CONSTITUTION
PAPER CODE: MC-EEE 301

6. Describe the Directive Principles of State Policy.
7. Discuss about the Central – State govt. relationship.
8. Describe the power & function of Prime Minister as per Indian Constitution.
9. Discuss the role & functions of the Mayor.
10. Write a short note on – Public Interest Litigation(PIL).

PAPER NAME: ELECTRIC CIRCUIT THEORY
PAPER CODE: PC-EEE 301

6. State Sate superposition theorem. Explain it.
7. Write some applications of maximum power transfer theorem..
8. State Norton's Theorem. Explain it.
9. Define Apparent power and Power factor.
10. **Determine current in 5ohm resistor by any one method.**



PAPER NAME: ANALOG ELECTRONICS
PAPER CODE: PC-EEE 302

6. Explain the differences between Semiconductor and Diode.

7. What are the characteristics of an IC? What is FET? Give its classification.

8. What is P-Channel MOSFET? Explain briefly.
9. Write shot notes on: Photolithography

10. What is Amplifier? Explain briefly.

PAPER NAME: ELECTROMAGNETIC FIELD THEORY
PAPER CODE: PC-EEE 303

9. Explain the coordinate system and their transformation in circular cylindrical coordinate system.
10. Describe the coordinate system and their transformation spherical coordinate system?
11. Explain the terms Gradient and Divergence of a vector?
12. What is curl of a vector? State and prove Stoke's theorem.

13. Explain in detail Coulomb's law in Electrostatics.
14. Derive Gauss Law in electrostatics. How is it related to Maxwell's Equations?
15. Explain Biot-Savart law in Magneto statics? What is Ampere's circuital law?
16. Describe the Magnetic Flux Density.

B.TECH-3RD SEM-EEE-PRACTICAL

PAPER NAME: ELECTRIC CIRCUIT THEORY LABORATORY
PAPER CODE: PC-EEE 391

1. Verification of super position theorem using hard ware and digital simulation.

2. Verification of maximum power transfer theorem using hardware and digital simulation.

3. Verification of Thevenin's theorem using hard ware and digital simulation.

4. Verification of series resonance using hard ware and digital simulation.