INSTITUTE OF SCIENCE & TECHNOLOGY

ASSIGNMENT QUESTIONS FOR ODD SEM 2025

B.TECH-5TH SEM-CE-THEORY

PAPER NAME: DESIGN OF RC STRUCTURES
PAPER CODE: CE(PC)501

1. (a) Explain the fundamental differences between the Working Stress Method (WSM) and Limit State Method (LSM) of design of reinforced concrete members, citing the provisions of IS 456:2000.
   (b) A rectangular beam section is subjected to a factored bending moment of 150 kNm. Design a singly reinforced beam using M20 concrete and Fe415 steel. Use LSM and show detailing.
2. (a) Define balanced, under-reinforced, and over-reinforced sections. Discuss their structural behavior under bending.
   (b) A simply supported beam of effective span 5 m carries a characteristic uniformly distributed load of 40 kN/m (including self-weight). Design the beam section (singly reinforced) using WSM with M25 concrete and Fe415 steel.
3. (a) Write short notes on the following with reference to IS 456:2000:
   i. Development length
   ii. Bond stress
   iii. Redistribution of moments in beams.
   (b) Design a doubly reinforced rectangular beam section of effective span 6 m carrying a factored uniformly distributed load of 60 kN/m. Use M20 concrete and Fe500 steel.
4. (a) Explain the IS 456:2000 code provisions for design of two-way slabs subjected to uniformly distributed load. How does the aspect ratio of the slab affect the design?
   (b) A simply supported two-way slab of clear span 4.5 m × 6.0 m is subjected to a live load of 3 kN/m² and finishes of 1 kN/m². Design the slab and provide reinforcement details using M25 concrete and Fe415 steel.
5. (a) Differentiate between short columns subjected to uniaxial and biaxial bending. Discuss the use of SP:16 design charts in this context.
   (b) Design an isolated square footing for a column of size 400 mm × 400 mm transmitting a factored axial load of 1000 kN. The SBC of soil is 200 kN/m². Use M25 concrete and Fe415 steel. Provide design and detailing.

PAPER NAME: ENGINEERING HYDROLOGY
PAPER CODE: CE(PC)502

1. (a) Explain the Hydrologic Cycle with a neat sketch. Discuss the global and India's water budget in detail.
   (b) A river basin in India has an annual precipitation of 1200 mm. Out of this, the average annual evapo-transpiration is 500 mm and the runoff is 450 mm. Estimate the change in storage and discuss its significance in the context of India's water resources.
2. (a) Define a catchment. Describe different types of catchments and the factors influencing their characteristics.
   (b) Draw and explain the procedure for delineation of a catchment boundary using a topographic map.
   (c) A catchment has an area of 150 km². If the average annual rainfall over the catchment is 1200 mm and 30% of the rainfall is lost due to evaporation and infiltration, estimate the annual runoff volume in million cubic meters (MCM).

3. (a) Explain different types of rain gauges and their functioning. Which type is recommended for Indian conditions?
   (b) State IS coda provisions regarding the optimum number of rain gauges in a catchment.
   (c) A catchment has an area of 1200 km² with 6 existing rain gauge stations. The recorded annual rainfall is 800 mm, 850 mm, 780 mm, 760 mm, 820 mm, and 790 mm. Determine the optimum number of stations required if the allowable error is 10%.
4. (a) Explain the methods of estimating mean precipitation over an area: Arithmetic Mean, Thiessen Polygon, and Isohyetal method. Discuss their merits and demerits.
   (b) The annual rainfall (in mm) at four stations P, Q, R, and S in a catchment is 820, 780, 840, and 800 respectively. The areas influenced by them using Thiessen method are 120 km², 90 km², 150 km², and 140 km². Estimate the average annual rainfall over the catchment.
5. (a) Define Unit Hydrograph. State its assumptions and applications in hydrology.
   (b) A 4-hour unit hydrograph of a catchment is given below:

Time (hr)	0	4	8	12	16	20	24
Ordinate (m^3/s)	0	20	60	100	60	30	0

Using the method of superposition, derive the direct runoff hydrograph (DRH) due to a storm producing 3 cm rainfall excess in 4 hours followed by 2 cm in the next 4 hours.

PAPER NAME: ENVIRONMENTAL ENGINEERING-II
PAPER CODE: CE(PC)505

1. (a) Differentiate between sanitary sewage, storm sewage, sullage, black water, and grey water with examples.
   (b) Discuss the applicability, advantages, and disadvantages of the combined system and separate system of sewerage.
   (c) A town has a population of 80,000 with a water supply rate of 135 lpcd. Assuming 80% of water supplied turns into wastewater, estimate the average sewage flow.
2. (a) Explain the different shapes of sewers used in practice. Discuss the hydraulic advantages of the egg-shaped sewer.
   (b) Describe the operation and maintenance issues commonly observed in sewer systems.
   (c) A circular sewer of diameter 1.2 m is laid at a slope of 1 in 500. Assuming it flows half full, calculate the discharge. Use Manning's n = 0.013.
3. (a) Discuss the physical, chemical, and biological characteristics of municipal sewage.
   (b) What are the effluent discharge standards for BOD, COD, TSS, and pH in India?
   (c) A sewage sample has the following test data:
   BOD_5 = 180 mg/L
   COD = 400 mg/L
   Suspended solids = 220 mg/L
   Comment on the treatability of this sewage and suggest the level of treatment required before disposal.
4. (a) With the help of a neat flowchart, explain the primary and secondary treatment of domestic wastewater in a sewage treatment plant (STP).
   (b) Compare activated sludge process and trickling filter in terms of process, advantages, and limitations.
   (c) A sewage treatment plant treats 15 MLD of sewage. If the average BOD of influent is 200 mg/L and effluent BOD after treatment is 30 mg/L, calculate the percentage BOD removal efficiency.
5. (a) Write short notes on sludge thickening, digestion, and drying beds.
   (b) Explain the plumbing requirements of a high-rise building. Discuss the role of pressure reducing valves

and break pressure tanks.
(c) A residential colony generates 500 kg/day of sludge (dry basis). If the digestion process reduces the volatile solids by 45%, determine the stabilized sludge quantity to be disposed of.

PAPER NAME:SOIL MECHANICS-II
PAPER CODE: CE(PC)504

1. (a) Explain Terzaghi's one-dimensional consolidation theory and discuss the significance of compression index and coefficient of consolidation.
   (b) In a consolidation test, a clay layer of 2.5 m thickness is subjected to a pressure increment of 100 kN/m². The initial void ratio is 0.9 and the compression index is 0.25. Calculate the settlement of the layer due to the applied pressure. Assume double drainage.
2. (a) Describe the Standard Proctor and Modified Proctor compaction tests. How does the compaction effort affect soil properties?
   (b) A soil sample has the following results from a Standard Proctor Test: Maximum Dry Density = 1.85 g/cc, Optimum Moisture Content = 14%. If the degree of saturation is 100% at OMC, determine the specific gravity of soil grains.
3. (a) Derive Rankine's earth pressure theory for active earth pressure. What are the assumptions made in the derivation?
   (b) A vertical retaining wall 6 m high retains a horizontal cohesionless backfill with $\varphi = 30°$ and unit weight of soil = 18 kN/m³. Compute the active earth pressure at the base of the wall and the total active thrust on the wall.
4. (a) Discuss the factors affecting the bearing capacity of shallow foundations. Compare general shear failure and local shear failure.
   (b) A square footing of 2 m × 2 m is placed at a depth of 1.5 m in a dense sand deposit having $c = 0$, $\varphi = 38°$, and $\gamma = 19$ kN/m³. Using Terzaghi's bearing capacity theory, determine the ultimate bearing capacity of the footing. Use $N_c = 73.3$, $N_q = 41.4$, $N_\gamma = 42.4$.
5. (a) Explain different types of slope failures with neat sketches. How is Taylor's stability number used in slope stability analysis?
   (b) An infinite slope is formed in a soil having $c = 0$, $\varphi = 32°$, and $\gamma = 20$ kN/m³. The slope angle is 20° and depth of soil is 8 m. Determine the factor of safety with respect to shear strength when the water table is at the ground surface.

PAPER NAME: STRUCTURAL ANALYSIS-I
PAPER CODE:CE(PC)503

1. (a) Define static and kinematic indeterminacy. Explain the stepwise procedure to determine the degree of indeterminacy of a structure.
   (b) Determine the degree of static and kinematic indeterminacy for the continuous beam shown below:
   - Beam ABC with spans AB = 6 m and BC = 4 m, fixed at A, simply supported at B, and roller at C.
2. (a) State and explain Castigliano's second theorem. How is it applied for finding deflections in elastic structures?
   (b) A simply supported beam of span 8 m carries a concentrated load of 60 kN at its mid-span. Using the Unit Load Method, determine the vertical deflection at the center of the beam. Take $E = 2 \times 10^5$ N/mm² and $I = 4 \times 10^8$ mm⁴.
3. (a) Explain the procedure to construct influence line diagrams (ILDs) for reactions, shear force, and bending moment in a simply supported beam.
   (b) Draw the ILD for shear force and bending moment at a section 3 m from the left support of a simply supported beam of span 9 m. Also determine the maximum bending moment at that section due to a uniformly distributed rolling load of 20 kN/m over the entire span.

4. (a) Discuss the Theorem of Three Moments. Derive its governing equation.
   (b) A continuous beam ABC has two equal spans of 6 m each and carries a uniformly distributed load of 30 kN/m on both spans. Using the theorem of three moments, determine the support moments at B.
5. (a) State Muller–Breslau's principle. Explain how it is used in constructing influence line diagrams for statically indeterminate structures.
   (b) Using Muller–Breslau's principle, sketch the ILD for the support reaction at the fixed end of a propped cantilever beam of span 8 m. Also compute the maximum reaction when a concentrated moving load of 100 kN traverses the beam.

PAPER NAME: TRANSPORTATION ENGINEERING
PAPER CODE: CE(PC)506

1. (a) Summarize the main recommendations of the *Jayakar Committee* and explain their importance in the development of roads in India.
   (b) Classify roads as per the *Third 20-Year Road Development Plan (1981–2001)*. Draw neat sketches of different road patterns and explain their applications.
2. (a) Explain the factors controlling the alignment of highways. Discuss the role of engineering surveys in highway location.
   (b) A valley curve is formed when a descending gradient of 1 in 30 meets an ascending gradient of 1 in 40. Design the length of the valley curve for a design speed of 80 km/h to fulfill the comfort condition. Assume $g = 9.81$ m/s² and permissible rate of change of acceleration = 0.6 m/s³.
3. (a) Explain the PIEV theory. Derive an expression for stopping sight distance (SSD*)* and state the factors affecting it.
   (b) A horizontal curve of radius 250 m is provided on a highway. The design speed is 80 km/h. Calculate the super elevation required. Also check its value against the maximum allowable super elevation (as per IRC). Take coefficient of lateral friction = 0.15.

4. (a) Define traffic volume, traffic density, and traffic capacity. Explain their interrelationship with the help of a fundamental diagram of traffic flow.

(b) A four-arm intersection in an urban area has the following traffic flow data (vehicles/hr):

- North approach = 400
- South approach = 350
- East approach = 300
- West approach = 250

Design a two-phase traffic signal using Webster's method. Assume all red time = 4 seconds and lost time per phase = 2 seconds.

5.(a) Discuss the differences between *flexible pavements* and *rigid pavements* with neat sketches. Explain the major causes of pavement distresses.

(b) Design the thickness of a rigid pavement slab using the following data:
Wheel load = 5100 kg, Radius of contact area = 15 cm, Modulus of elasticity of concrete = 3×10^5 kg/cm², Poisson's ratio = 0.15, Modulus of sub-grade reaction = 8 kg/cm³. Use Westergaard's stress equation for interior loading condition.

B.TECH-5TH SEM-CE-PRACTICAL

PAPER NAME: COMPUTER APPLICATION IN CE
PAPER CODE: CE(PC)597

1. What is a computer?
2. What are hardware and software?
3. What are input and output devices?
4. How would you use a spreadsheet to calculate the load-bearing capacity of a beam?
5. How do you ensure data integrity when managing large project datasets?

PAPER NAME: ENVIRONMENTAL ENGINEERING LAB
PAPER CODE: CE(PC)595

1. List out Experiments on Water?
2. What is Reagents?
3. Explain Acidity Test?
4. Types of Acidity?
5. List out materials contributed towards Alkalinity?

PAPER NAME: SOIL MECHANICS LABORATORY
PAPER CODE: CE(PC)594

1. What is definition of soil in Soil Mechanics?
2. What Is Meant By Elastic Limit?
3. State The Applications Of Modulus Of Elasticity?
4. What Is Meant By Poisson Ratio?
5. What Is Punching Shear?

PAPER NAME: TRANSPORTATION ENGINEERING LAB
PAPER CODE: CE(PC)596

1. What is the purpose of the Aggregate Impact Value Test?
2. What is the significance of a low vs. high Aggregate Impact Value?
3. How is the Los Angeles abrasion value used?
4. What is the difference between specific gravity and bulk specific gravity?
5. What are the key properties of bitumen tested in a lab?

PAPER NAME: RC DESIGN SESSIONAL
PAPER CODE: CE(PC)591

1. Design a one-way RCC slab for a small residential building using the Limit State Method.
   Include calculation of reinforcement and a neat reinforcement detailing drawing as per IS 456:2000.
2. Design a simply supported RCC beam for given loading conditions using the Limit State Method.
   Show flexural and shear design, reinforcement details, and prepare the working drawing.
3. Prepare the structural layout plan and framing plan of a small RCC framed building.
   Design one typical column and isolated footing, and compile a short design report with drawings and IS code references.

B.TECH-7TH SEM-CE-THEORY

PAPER NAME: ADVANCE STRUCTURAL ANALYSIS
PAPER CODE: CE-PE 704B

1. (a) Derive the stiffness matrix for a two–member plane truss element.
   (b) Using the matrix displacement method, analyze a simple pin-jointed plane truss with two members inclined at 45° supporting a vertical load at the joint.
   (c) Discuss the advantages of matrix methods over classical methods of structural analysis.
2. (a) Explain the finite difference method and its application in solving differential equations in structural engineering.
   (b) Solve the deflection of a simply supported beam of span 6 m carrying a uniformly distributed load of 20 kN/m using the finite difference method.
   (c) Write short notes on the relaxation technique with a simple example.
3. (a) Derive Navier's solution for a simply supported rectangular plate subjected to a uniformly distributed load.
   (b) Using Levy's solution, determine the deflection of a simply supported rectangular plate subjected to a sinusoidal loading.
   (c) Write short notes on the buckling of thin plates and state the governing differential equation.
4. (a) Explain the membrane theory of domes with neat sketches. Derive the expression for meridional and hoop stresses in a spherical dome under uniform load.
   (b) Derive expressions for stresses in a cylindrical shell subjected to internal pressure using membrane theory.
   (c) A cylindrical water tank of radius 10 m and thickness 0.2 m is subjected to an internal water pressure of 100 kN/m². Determine the hoop stress and meridional stress.
5. (a) Define stress invariants. Show that the sum of principal stresses remains invariant under a stress transformation.
   (b) Derive the equilibrium equations in three dimensions for a stressed elastic body.
   (c) A two-dimensional stress system at a point has $\sigma x = 60$ MPa, $\sigma y = 30$ MPa, and $\tau xy = 20$ MPa. Determine the principal stresses and maximum shear stress using stress transformation equations.

PAPER NAME: AIR AND NOICE POLLUTION & CONTROL
PAPER CODE: CE-PE 703A

1. (a) Classify air pollutants with examples and explain their sources.
   (b) Discuss the effects of photochemical smog and acid rain on human health and materials.
   (c) Explain the role of greenhouse gases in global warming with suitable diagrams.
2. (a) Define lapse rate and explain the difference between environmental and adiabatic lapse rate.
   (b) With neat sketches, explain different plume behavior patterns under various atmospheric stability conditions.
   (c) A stack releases pollutants at a height of 100 m. If the effective stack height required is 150 m, compute the additional stack height to be provided as per Gaussian plume considerations.
3. (a) Explain the Gaussian plume dispersion model with mathematical expression and assumptions.
   (b) Write short notes on air quality standards (NAAQS, emission standards, ambient standards).
   (c) The observed SO_2 concentration in a city is 80 µg/m³. Compare this value with the prescribed NAAQS for SO_2 and comment on air quality index classification.

4. (a) Describe the working principles of cyclone separator and electrostatic precipitator for particulate pollutant control with neat sketches.
   (b) Discuss methods of control of gaseous pollutants like absorption and adsorption with examples.
   (c) Explain any two modern techniques for controlling automobile emissions.
5. (a) Define sound pressure level, intensity level, and power level and derive their interrelations.
   (b) A continuous noise source produces a sound pressure of 2×10^{-5} N/m². Calculate the corresponding sound pressure level in dB (take reference pressure = 2×10^{-5} N/m²).
   (c) Discuss the effects of community noise on human health and explain methods of noise pollution control as per CPCB standards.

PAPER NAME: HYDRAULIC STRUCTURES
PAPER CODE: CE-PE 701C

1. (a) Classify different types of dams with neat sketches. Compare gravity dams and embankment dams in terms of design, construction, and suitability of site conditions.
   (b) Explain the functions of different components of a gravity dam with a neat diagram.
   (c) A gravity dam has a base width of 60 m, height 80 m, and a unit weight of concrete 24 kN/m³. Calculate the self-weight per meter length of the dam.
2. (a) Discuss the criteria for selecting a dam site. Explain the importance of reconnaissance survey and geophysical investigations in site selection.
   (b) List different field and laboratory tests used for foundation assessment of dams.
   (c) During site investigation, a borrow pit soil sample was tested in the laboratory and found to have a maximum dry density of 1.85 g/cc and optimum moisture content of 12%. If the dam requires an embankment of 2,50,000 m³, estimate the volume of soil to be excavated considering a 10% void ratio in borrow area soil.
3. (a) A gravity dam of height 70 m retains water up to the top. Compute the water pressure at the base and total hydrostatic force per meter length acting on the vertical upstream face. Also, find the point of application of this force from the base.
   (b) Explain uplift pressure and wave pressure acting on a gravity dam with neat sketches.
   (c) What are the possible modes of failure of a gravity dam? State the corresponding factor of safety recommended by IS codes.
4. (a) Explain different types of embankment dams with neat sketches. Discuss the importance of freeboard in embankment dam design.
   (b) Derive Laplace's equation for seepage analysis in an earth dam.
   (c) An earth dam has a homogeneous section with a height of 30 m and a horizontal filter at the downstream end. Using Casagrande's graphical method, draw the phreatic line and compute the seepage discharge if the coefficient of permeability is 3×10^{-5} m/s and length of flow path is 250 m.
5. (a) Define a spillway. Explain with sketches different types of spillways and their suitability under various site conditions.
   (b) Derive the expression for discharge over an ogee spillway. Discuss the factors affecting the coefficient of discharge.
   (c) A high overflow spillway has a design head of 4 m and an effective length of 60 m. If the coefficient of discharge is 2.05, calculate the maximum discharge capacity of the spillway.

PAPER NAME: METRO SYSTEM & ENGINEERING
PAPER CODE: CE-OE- 701A

1. a) Explain the necessity of Metro Rail Systems in urban transport planning. Discuss the social, environmental, and financial aspects of metro project development.
   b) A metro corridor of 32 km length has been proposed in a city. If the construction cost of an elevated line is ₹300 crore per km and the underground line is ₹600 crore per km, calculate the total project cost when 70% of the alignment is elevated and 30% is underground.
   c) Suggest measures to improve ridership forecasting during routing studies.
2. a) Describe the construction methods for underground metro tunnels. Compare the cut-and-cover method with Tunnel Boring Machine (TBM) method.
   b) A TBM excavates a circular tunnel of 6.2 m external diameter and 25 km total length. If the average advance rate is 10 m/day and the working efficiency is 70%, estimate the total time required for tunneling.
   c) Explain the importance of safety and quality management in metro civil engineering works.
3. a) Write short notes on: i) Automatic Fare Collection (AFC) ii) SCADA systems in metro operation iii) Platform Screen Doors (PSD)
   b) A metro signaling system is designed for a headway of 2 minutes. If the train speed is 40 km/h and the station dwell time is 40 seconds, calculate the minimum line capacity (trains per hour per direction).
   c) Differentiate between centralized Operation Control Centre (OCC) and Backup Control Centre (BCC).
4. a) Explain the working principle of tunnel ventilation systems in metro rail. How is smoke control managed during emergencies?
   b) A metro train of 8 cars, each weighing 42 tonnes, runs on a gradient of 1 in 200. Calculate the additional tractive effort required to overcome the gradient resistance.
   c) Discuss the role of lifts and escalators in passenger movement and safety in metro stations.
5. a) Explain the role of Overhead Equipment (OHE) in metro electrification. Distinguish between Traction Substation (TSS) and Auxiliary Substation (ASS).
   b) The average traction power demand of a metro system is 90 MW. If the power factor is 0.9, calculate the apparent power rating of the substation and the reactive power requirement.
   c) Discuss the concept of green buildings in metro projects and its relevance to carbon credit mechanisms.

PAPER NAME: PAVEMENT DESIGN
PAPER CODE: CE-PE 705B

1. (a) Derive the expressions for vertical stress distribution in a homogeneous mass due to a concentrated wheel load.
   (b) Explain Burmister's two-layer theory with neat sketches.
   (c) A dual wheel load assembly exerts a load of 40 kN per wheel at a spacing of 0.35 m, with a tire pressure of 560 kN/m². Compute the Equivalent Single Wheel Load (ESWL) at a depth of 1.2 m.
2. (a) Discuss the McLeod method of flexible pavement design with design chart explanation.
   (b) Compare the AASHTO method and the IRC method of flexible pavement design.
   (c) Design a low-volume rigid pavement slab for a village road carrying light traffic, given wheel load = 50 kN, subgrade modulus = 40 MN/m³, and allowable flexural strength of concrete = 4 MPa.
3. (a) Explain the step-by-step construction procedure of a flexible pavement, starting from subgrade to surface course.
   (b) Describe the method of alignment-wise marking using chainage for earthwork in highways.
   (c) Write the construction procedure of low-volume rigid pavement, mentioning field control checks at different stages.

4. (a) Define functional evaluation of pavements. Discuss methods of measuring roughness, skid resistance, and serviceability index.
   (b) Explain the working principle of the Benkelman Beam Test for structural evaluation of pavements.
   (c) A pavement has the following rebound deflection values (mm): 1.21, 1.30, 1.28, 1.25, 1.22. Determine the characteristic deflection as per IRC guidelines.
5. (a) What are the different types of pavement distresses in flexible and rigid pavements? Give causes and remedial measures.
   (b) Explain the design of bituminous overlays on flexible pavements using IRC recommendations.
   (c) A concrete pavement requires strengthening. Using the conventional overlay design method, determine the thickness of concrete overlay required if existing slab thickness = 180 mm, required slab thickness for traffic = 250 mm.

PAPER NAME: PRESTRESSED CONCRETE
PAPER CODE: CE-PE 702A

1. Explain the different types of prestressing systems used in practice. Mention their advantages and limitations.
   b) A simply supported prestressed concrete beam of span 10 m carries a uniformly distributed load of 40 kN/m (including self-weight). If the beam has a cross-section 300 mm × 600 mm and a prestressing force of 1200 kN is applied at an eccentricity of 100 mm at mid-span, calculate the stresses at the top and bottom fibre at mid-span.
   c) Discuss the various losses of prestress in post-tensioned members.
2. a) What are the limitations of Elastic and Ultimate Load Methods of design? How does the Limit State Method overcome these issues?
   b) Design the shear reinforcement for a prestressed concrete beam of size 250 mm × 500 mm subjected to a shear force of 180 kN. Assume fck = 40 N/mm² and fy = 415 N/mm².
   c) Explain the Lin's method of design for prestressed concrete sections.
3. a) Define anchorage zone stresses in post-tensioned members. Why is reinforcement required in the end block?
   b) A rectangular post-tensioned beam of 300 mm × 600 mm carries a prestressing force of 1000 kN, applied through a bearing plate of 150 mm × 150 mm at the end. Using Guyon's method, calculate the transverse tensile stress at a distance equal to half the depth of the beam.
   c) Suggest suitable anchorage zone reinforcement detailing to resist bursting stresses.
4. a) What are the advantages of continuous prestressed concrete members compared to simply supported beams?
   b) A two-span continuous beam (each span 12 m) is prestressed with a parabolic cable having an eccentricity of 100 mm at mid-span and zero at supports. The prestressing force is 1500 kN. Determine the secondary moment at the central support using the three-moment theorem.
   c) Explain the methods of achieving continuity in prestressed structures.
5. a) Differentiate between composite prestressed concrete construction and monolithic construction.
   b) Design a prestressed concrete pole of 11 m height subjected to a transverse load of 2 kN at the top. Assume that the pole section is circular with a diameter of 200 mm and prestressing force of 250 kN applied concentrically. Check the stresses at the extreme fibres.

B.TECH-5TH SEM-ME-THEORY

PAPER NAME: HUMANITIES-I (EFFECTIVE TECHNICAL COMMUNICATION)
PAPER CODE: HM-HU501

1. Give examples of Business Ethics.
2. What are the typical components of technical reports?
3. Briefly discuss about the importance of Group Discussion Skill.
4. Differentiate between general and technical communication.
5. How is "Language" a tool of communication?
6. What is an API document?
7. State the role and responsibility of an engineer.
8. Write a short note on Perception.

PAPER NAME: HEAT TRANSFER
PAPER CODE: PC-ME501

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.

PAPER NAME: SOLID MECHANICS
PAPER CODE: PC-ME502

1. Explain the stress at a point with suitable figure?
2. Define elasticity and Plasticity.
3. Explain Plane stress and Plain strain.
4. Explain principal Plane with derivation.
5. Explain the term 'condition of pure shear'.
6. What is the assumption of Plasticity theory?
7. Explain stress Displacement Relations and Hooke's law.
8. Derive solutions for axisymmetric problems for Plane stress and plane Strain.
9. How to calculate the torque of thin- walled sections.
10. Explain in detail the term 'Anisotropic Plasticity'.

PAPER NAME: KINEMATICS & THEORY OF MACHINES
PAPER CODE: PC-ME503

1. What are the different types of cam & follower? What is the pressure angle?
2. A simply supported beam AB of span .75m is carrying a body of mass 90 kg at 0.25m from one end. Calculate the natural frequency of transverse vibration. Take young's modulus of elasticity is 200Gpa. & shaft diameter is 50mm.
3. Describe porter governor function and deduce a relation to find the height of the governor.
4. What do you mean by critical speed of shafts? how critical speed can be determined.
5. Explain in what way the gyroscopic couple affects the motion of a ship while taking a turn.
6. Establish an expression for the natural frequency of longitudinal vibration s for a simply supported beam carrying a number of point loads, by Dunkerley's method .
7. calculate the periodic time of Damped vibration when a weight of 50 kg suspended from a spring produces a static deflection of 14 mm & when in motion it experiences a viscous damping force with value of 30 kg at a velocity of 15 cm/s.
8. What is interference? Find the minimum number of teeth of pinion to avoid interference.

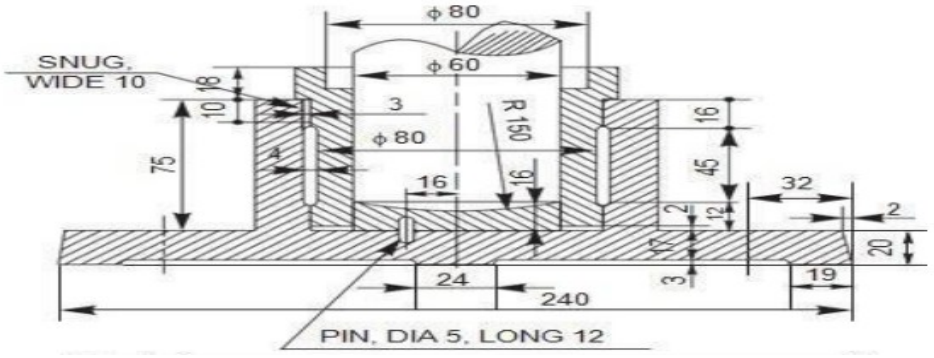
B.TECH-5TH SEM-ME-PRACTICAL

PAPER NAME: MECHANICAL ENGINEERING LABORATORY-I(THERMAL)
PAPER CODE: PC-ME591

1. Explain the procedure to determine the coefficient of discharge of an orifice meter and a venturi meter. Why is the coefficient of discharge less than unity?
2. Describe the experimental method to determine the performance characteristics of a centrifugal pump. Discuss the significance of head, discharge, efficiency, and power in its performance evaluation.
3. Compare the performance characteristics of Pelton Wheel, Francis Turbine, and Kaplan Turbine. How does the specific speed of a turbine help in the selection of a suitable turbine for a given site?
4. How can the thermal conductivity and specific heat of a solid object be determined experimentally? Discuss the practical importance of these properties in heat transfer applications.
5. With the help of a neat sketch, explain how the performance characteristics of a vapour compression refrigeration system are evaluated. Define coefficient of performance (COP) and discuss factors affecting it.
.

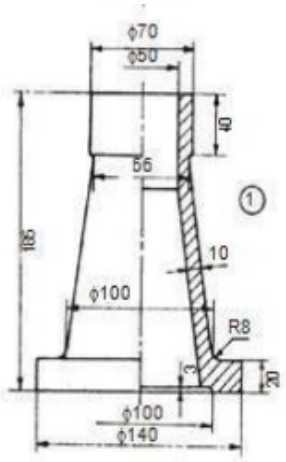
PAPER NAME: MACHINE DRAWING-II LAB
PAPER CODE: PC-ME592

1. Sketch neatly a cotter joint for connecting two 40mm diameter rods. Take other suitable important dimension.
2. Draw the sectional front view from the given figure.



3. Draw the sectional front view from the given figure.

4.



B.TECH-7TH SEM-ME-THEORY

PAPER NAME: ECONOMICS FOR ENGINEERS
PAPER CODE: HM-HU 701

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: INDUSTRIAL ENGINEERING
PAPER CODE: OE-ME701A

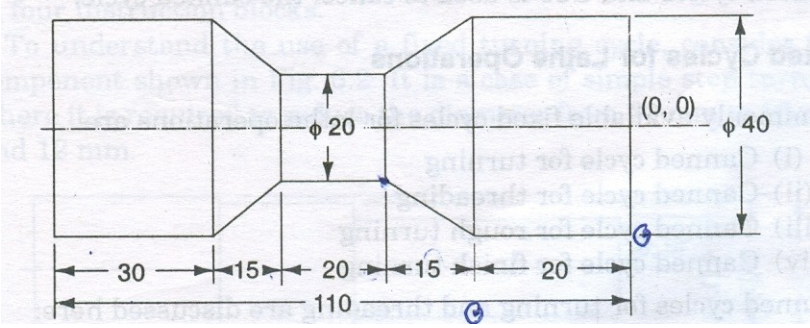
1. What are the objectives of Inspection& Quality control?
2. What is the importance and functions of HRM?
3. What are the differences between Variables & attributes in sampling plans?
4. What are the major types of Acceptance Sampling?
5. What are the advantages and disadvantages of Acceptance Sampling?
6. Derive the EOQ formula for the manufacturing model with shortage.
7. Derive the formula for determining number of production runs and optimum lot size to be manufactured.
8. Describe the cost associated with the inventories.
9. What are the functions of inventory control?

PAPER NAME: ADVANCED MANUFACTURING TECHNOLOGY
PAPER CODE: PC-ME 701

1. Discuss the mechanism of material removal for Abrasive jet machining (AJM). State their limitations.

2. What are the over voltages in ECM process. Classify and Explain them.
3. Why the AJM is not suitable for soft materials? Explain priefly.
4. Write the laws on which the electro-chemical machining depends.
5. Explain the orbital AFM process.
6. Write down the need of N.T.M process. Write the difference between traditional and nontraditional machining process. Explain with figure the Ultrasonic machining (USM) process with its varies components.
7. Describe with neat sketch the working principle of Laser beam machining (LBM)? Draw the schematic diagram of AJM set up .
8. State the Faraday^{s}' law of electrolysis. Describe with fig. ECM process.Write advantages disadvantages of its.
9. Explain with a neat sketch the operation of the canned cycle G81 as per ISO.

Write the part programming for the component shown in figure below. Keeping maximum depth of cut 2 mm. (All dimension are in mm)



PAPER NAME: ADVANCE WELDING TECHNOLOGY
PAPER CODE: PE-ME702H

1. Explain the process and equipment of oxy-acetylene gas welding with sketch.
2. Explain thermit welding, and also draw a neat sketch.
3. Explain arc welding with sketch.
4. How can you specify an electrode?
5. Explain the pressure versus time graph for resistance welding.
6. Explain and draw the Welding Symbol and joint design. Write the Welding Metallurgy and Effect of HAZ using different process parameter and characteristic of weldment.
7. Write short notes on: (*i*) Welding rods (*ii*) Fluxes(*iii*) Gas flames (*iv*) Working of pressure regulators(*v*) Working pressure of gases in H.P and L.P welding and cutting.
8. Write short notes on Welding rods , Fluxes ,Gas flames , Working of pressure regulators(*v*) Working pressure of gases in H.P and L.P welding and cutting.
9. Write short notes on the following:(*i*) Hoses(*ii*) Torch tip(*iii*) Welding torch and its parts(*iv*) Welding goggles(*v*) Wire brush(*vi*) Filler rod in gas welding.
10. Write short notes on: (*i*) Forge or smithy welding. (*ii*) Leftward welding. (*iii*) Rightward welding. (*iv*) Vertical welding
11. Explain with neat sketch solid state welding and friction welding.

12. What are different equipment used in Arc welding and also state their application?
13. Write a short note on Welding of plastics and composites materials.
14. What is welding fixtures? What is a HAZ effect and what are process parameters on the characteristics of weldment?
15. Explain the Submerged Arc welding Process with neat sketch.
16. Explain the Friction Stir welding and under water welding process. (only Working Principles)

PAPER NAME: AUTOMOBILE ENGINEERING
PAPER CODE: PE-ME 701A

1. a) Explain how the power can be transmitted in front wheel drive by using a neat diagram.
b)Briefly discuss the working principle of a simple Carburetor system with neat sketch
2. a)What is ABS and how does ABS helps in improving uncontrolled skidding?.
b)Explain common rail diesel injection system with necessary diagram.
3. what is the function of suspension system. explain with neat sketch telescopic type shock absorber.
4. Explain the construction working and performance of a fluid flywheel. Enumerate the advantages of fluid flywheel over the other types of clutches.
5. Draw and explain with a simple sketch, working of a constant mesh gear box.
6. Explain with a simple sketch, construction and working of differential in a automobile
7. a) With the help of a schematic diagram, explain Ackerman steering mechanism.
b) Explain the functioning of independent front wheel suspension system with torsion bar in a automobile.
8. Explain with a suitable schematic diagram, working of hydraulic braking system in a vehicle. Briefly discuss the functional requirements of braking fluids.
9. Explain the working of single plate clutch with the help of suitable diagram.

B.TECH-7TH SEM-ME-PRACTICAL
PAPER NAME: MECHANICAL ENGINEERING LABORATORY III (MANUFACTURING)
PAPER CODE: PC-ME 791

1. Programming on CNC Lathe using G and M Codes
2. Programming on CNC Milling Machine using G and M Codes
3. Testing for Weld Quality
4. Testing of moulding sand.

B.TECH-5TH SEM-EE-THEORY
PAPER NAME: OBJECT ORIENTED PROGRAMMING
PAPER CODE: OE-EE-501B

1. Explain the concept of encapsulation in object oriented programming.
2. What is object identity? How does it differ from object equality?
3. Define polymorphism in the context of object-oriented programming.
4. Differentiate between compile-time polymorphism and runtime polymorphism with examples.
5. Explain how encapsulation helps in data hiding.
6. Describe the role of method overloading and method overriding in achieving polymorphism.

PAPER NAME: ELECTRIC MACHINE-II
PAPER CODE: PC-EE 501

1. Explain the principle of 3 phase induction motor
2. What do you mean by Distribution Factor of AC machine windings?
3. Relation between Frequency, Speed and poles in an Induction machine?
4. Derive the torque equation of a three phase induction motor and draw the torque vs slip characteristics of Induction motor.
5. Write a short note on :(i) Auto transformer (ii) Star-Delta Starter.

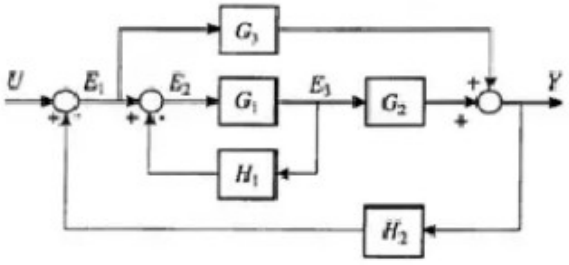
PAPER NAME: POWER SYSTEM-I
PAPER CODE: PC-EE 502

1. What do you mean by Voltage Regulation&Transmission Efficiency in Transmission System. Mention its mathematical expressions.
2. How many types of insulator used in overhead transmission lines. What is String Efficiency ? Also write the mathematical expression of it.
3. Draw the flow diagram of Transmission And Distribution System from the Generating Station to Consumers. Draw the diagram of Distribution System.
4. How many types of Distribution system according to the number of Substation ? Briefly discuss along with proper diagram.
5. What do you mean by Transmission System and Distribution System in Power system?
6. Write down briefly about the classification of Transmission System (according to the distance or line voltage).
7. Write down the comparison between the Conventional And Non-conventional Energy sources with proper examples.
8. Write down the comparison betweenDC transmission & AC transmission system.

PAPER NAME: CONTROL SYSTEM
PAPER CODE: PC-EE 503

1.

a)state and explain masons gain formula and also explain the terms with example
b) Determine the transfer function of the block diagram given below



2. Explain and Derive Steady State Error and error constant for different types of control system.
3. Explain in detail about transient response of second order system.
4. Define control systems? What is feedback? What type of feedback is employed in control systems?
5. Define peak overshoot? Define accelerating error constant? What is the need for a controller?

PAPER NAME: POWER ELECTRONICS
PAPER CODE: PC-EE 504

1. Explain the operation of a PN junction diode with the help of its V-I characteristics.
2. Describe the application of a diode as a rectifier.
3. Explain the construction and operation of an SCR with the help of its equivalent circuit.
4. Describe the turn-on and turn-off methods of an SCR.
5. Describe the different regions of operation of a BJT.

PAPER NAME: RENEWABLE & NON-CONVENTIONAL ENERGY SOURCES
PAPER CODE: PE-EE 501C

1. Explain how energy consumption can be considered as a measure of a nation's development. Mention its limitations.?
2. What are the positive and negative environmental impacts of renewable energygeneration?
3. Discuss the global strategies for meeting future energy requirements?
4. Write a short note on the Kyoto Protocol and its impact on energy policies?
5. Explain the principle of tidal power generation**.** Write short notes on single-basin and double-basin tidal power plants.
6. What is ocean thermal energy conversion (OTEC)**?**
7. Discuss the role of renewable energy in India's future power scenario.
8. Compare conventional vs. non-conventional energy sources in terms of availability, cost, efficiency, and environmental impact.
9. Define biogas. Explain the process of biogas generation with a schematic diagram of a biogas plant.

B.TECH-5TH SEM-EE-PRACTICAL
PAPER NAME: ELECTRIC MACHINE-II LAB
PAPER CODE: PC-EE 591

1. Different methods of starting of a 3-phase cage induction motor & their comparison [DOL, Auto transformer & Star-delta]
2. Study of equivalent circuit of three phases Induction motor by no load and blocked rotor test.
3. Toperformloadtestonsinglephaseinductionmotortoobtaintheperformancecharacteristics.
4. Tofindregulationofathree-phasealternatorbysynchronousimpedance method(EMF method).

PAPER NAME: POWER SYSTEM-I LAB.
PAPER CODE: PC-EE 592

1. Determination of The Generalized Constants A.B, C, D of Long Transmission Line And Regulation of A 3-Φ Transmission Line Model.
2. Study of DifferentTypes of Insulators.
3. Determine The String Efficiency of An Insulator String Used in Transmission Line.

4. Measurement of Earth Resistance by Earth Tester.

5. Determination of Dielectric Strength of Insulating Oil.

PAPER NAME: CONTROL SYSTEM LAB.
PAPER CODE: PC-EE 593

1. Familiarization with MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE.
2. Simulation of Step response & Impulse response for type-0, type-1 & Type-2 system with unity feedback using MATLAB & PSPICE.
3. Determination of Root locus, Bode plot, Nyquist plot using MATLAB control system tool box for a given system &stability by determining control system specification from the plot.
4. Determination of PI, PD and PID controller action of first order simulated process.

PAPER NAME: POWER ELECTRONICS LAB
PAPER CODE: PC-EE 594

1. Study of the characteristics of an SCR.
2. Study of the characteristics of a TRIAC.
3. Study of different triggering circuit of an SCR.
4. Study of the operation of a single phase full controlled bridge converter with R and R-L load.

B.TECH-7TH SEM-EE-THEORY

PAPER NAME: PRINCIPLE OF MANAGEMENT
PAPER CODE: HM-EE 701

1. What are the various objectives of planning?
2. Explain the benefits and weaknesses of MBO.
3. Describe any four quantitative techniques used for management decision-making?
4. Describe the principles and steps that constitute the organising process.
5. What are the bases for departmentation in a business organisation? State also the difficulties of delegation.
6. State the main causes of conflict between line and staff officials in an enterprise. How can they be removed?

PAPER NAME: COMPUTER NETWORK
PAPER CODE: OE-EE 702C

1. Explain the OSI and TCP/IP reference models. Compare them in terms of layers, functionalities, and protocols.
2. What are the different types of transmission media? Explain guided and unguided media with examples.
3. Describe the various error detection and correction techniques used in the data link layer.
4. Differentiate between TCP and UDP in terms of functionality, reliability, and usage scenarios.
5. What are congestion control techniques in the transport layer? Explain the Leaky Bucket and Token Bucket algorithms.

PAPER NAME: COMPUTER GRAPHICS
PAPER CODE: OE-EE 701C

1. Explain the RGB color model and the use of direct coding and lookup tables in graphics.
2. Differentiate between active and passive graphics devices with examples.
3. What are raster scan displays and storage tube displays? Explain their advantages.

4. Explain the DDA line drawing algorithm and its step-by-step working.
5. Explain scan line polygon filling, boundary fill, and flood fill algorithms.
6. Explain 3D transformations including translation, rotation about an arbitrary axis, scaling, and reflection through an arbitrary plane.

PAPER NAME: ELECTRIC DRIVE
PAPER CODE: PC-EE 701

1. What is Diversity Factor and Plant Capacity Factor ? Mention their mathematical expressions.
2. Short note on SRM Drives &Stepper Motor Drives.
3. Write a short note on : (i)Demand Factor (ii) Load Factor.
4. Comparison of the Control Methods of Induction Motor Drives.
5. Write down the differentIndustrial Applications ofElectric Drives.
6. Write Various control strategies of Synchronous motor Drives.
7. Write short notes on the Solar and Battery Powered Drives.

PAPER NAME: POWER GENERATION ECONOMICS
PAPER CODE: PE-EE-701C

1. Discuss about load factor, plant capacity factor, plant use factor, demand factor.
2. Discuss on Availability based tariff (ABT).
3. Discuss on Thermal unit constraints, Hydro constraints.
4. Discuss on Transmission loss formulae and its application.
5. Discuss on load forecasting technique and application in power system.

B.TECH-7TH SEM-EE-PRACTICAL

PAPER NAME: ELECTRIC DRIVE LAB
PAPER CODE: PC-EE 791

1. Study of Thysistor controlled DC Drive.
2. Study of Chopper fed DC Drive.
3. Study of AC Single phase motor-speed control using TRIAC.
4. Study of V/f control operation of 3F induction motor drive.
5. Study of VSIfedInductionmotorDriveanalysisusingMATLAB/SPICE/PSIM Software.

B.TECH-5TH SEM-CSE-THEORY

PAPER NAME: SOFTWARE ENGINEERING
PAPER CODE:ESC501

1. Explain the phases, advantages, and disadvantages of the Waterfall Model with a neat diagram.
2. Explain the Spiral Model with diagram and compare it with Waterfall Model.
3. Define System Design and draw a context diagram and Level-0 DFD for a Library Management System.
4. Explain Problem Partitioning with an example and its importance in design.
5. Explain Top-Down and Bottom-Up design approaches with examples and compare them.

PAPER NAME: INTRODUCTION OF INDUSTRIAL MANAGEMENT (HUMANITIES III)

PAPER CODE: HSMC-501

1. Discuss about the factors influencing job satisfaction.
2. Write a short note on – Economic Order Quantity(EOQ).
3. Differentiate between CPM & PERT.
4. Write a short note on – Production Planning and Control(PPC).
5. Discuss about the objectives of Inventory Control.

PAPER NAME: OPERATING SYSTEMS
PAPER CODE: PCC-CS502

1. What are the major services provided by an Operating System? Briefly explain system calls.
2. Describe the structure of an Operating System: Layered, Monolithic, and Microkernel.
3. What are the different process states and describe the Process Control Block (PCB)?
4. Explain paging in memory management and discuss the LRU and FIFO page replacement algorithms.

5. Describe different disk scheduling algorithms and compare SSTF, SCAN, and C-SCAN.

PAPER NAME: COMPILER DESIGN
PAPER CODE: PCC-CS501

1. What is a lexical analyzer? Define tokens, patterns, and lexemes with suitable examples. Explain the role of input buffering in lexical analysis.
2. Describe the specifications of a token and the process of recognition of tokens. Why are finite automata used in lexical analysis?
3. Explain how to convert a regular expression to an NFA. Illustrate the process with an example.
4. Write the procedure to convert a regular expression to a DFA. Compare NFA and DFA in terms of their structure and efficiency.
5. Discuss the design of a lexical analyzer generator (Lex). Explain how Lex simplifies the process of lexical analysis.
6. What is the role of a parser in syntax analysis? Differentiate between top-down parsing and bottom-up parsing with examples.

PAPER NAME: OBJECT ORIENTED PROGRAMMING
PAPER CODE: PCC-CS503

1. Give examples to illustrate its importance in OO programming.
2. Compare encapsulation, object identity, and polymorphism with respect to their role in OOP.
3. Explain their importance in software design.
4. What are commands as methods and commands as objects? Differentiate between them with examples.
5. Explain the importance of GUI programming in application development.

PAPER NAME: THEORY OF COMPUTATION
PAPER CODE: PEC-IT-501A

1. What is a finite state machine (FSM)? Define its capability, state equivalence, and k-equivalence with examples.
2. Differentiate between Deterministic Finite Automata (DFA) and Non-Deterministic Finite Automata (NFA). Write notes on their transition diagrams and language recognizers.
3. What is Arden's Theorem? State and prove it. Illustrate its application with an example.
4. Write short notes on:

a) Pumping Lemma for Regular Sets
b) Closure properties of Regular Languages

5. What is a Turing Machine? Explain its model and the concept of Universal Turing Machine (UTM). Why is the Halting Problem undecidable?

B.TECH-5TH SEM-CSE-PRACTICAL

PAPER NAME: SOFTWARE ENGINEERING LAB
PAPER CODE: ESC-591

1. Draw a context diagram for your selected project.
2. Prepare Level-0 and Level-1 DFDs for the system.
3. Write use case descriptions for at least three major use cases.
4. Prepare a use case diagram for the system.
5. Draw an activity diagram for the main process flow.

PAPER NAME: OPERATING SYSTEMS LAB
PAPER CODE: PCC-CS 592

1. Write a Bash shell script to create a backup of a directory and schedule it using `cron`.
2. Create two processes using `fork()` and implement inter-process communication using unnamed pipes (`pipe()`).
3. Write a C program that uses System V semaphores (`semget`, `semctl`, `semop`) to manage access to a shared resource (e.g., critical section simulation).
4. Demonstrate signal handling in C using `signal()` and `kill()` by writing a program that catches `SIGINT` and exits gracefully.
5. Write a C program to create a new process using `fork()`, replace the child process image using `exec()`, and handle zombie processes using `wait()`.

PAPER NAME: OBJECT ORIENTED PROGRAMMING LAB
PAPER CODE: PCC-CS 593

1. Write a program to create a Student class with data members (roll, name, marks) and a constructor to initialize them. Display the student details.
2. Write a program to perform matrix addition and multiplication using 2D arrays.
3. Implement a program with two threads: one prints even numbers and another prints odd numbers.
4. Write an applet to accept two numbers as parameters and display their sum.
5. Write a simple applet to display "Welcome to Java Applet".

B.TECH-7TH SEM-CSE-THEORY

PAPER NAME: PROJECT MANAGEMENT & ENTREPRENEURSHIP
PAPER CODE: HSMC 701

1. Discuss about the Contributions of Entrepreneurs to the society.
2. Write a short note on – SIDBI.
3. Differentiate between Divergent and Convergent Thinking.
4. Write a short note on – Work Breakdown Structure(WBS).
5. Describe the CPM and PERT Analysis.

PAPER NAME: INTRODUCTION TO PHILOSOPHICAL THOUGHTS
PAPER CODE: OEC-CS 701C

1. Discuss the meaning and scope of Indian philosophy. How does it differ from Western philosophy in its approach?
2. Explain the practical nature of Indian philosophy. How is philosophy connected with the spiritual and ethical life of an individual?
3. Indian philosophy is primarily concerned with the problem of liberation (Moksha). Explain this statement with reference to different schools.
4. Examine the role of the Vedas and Upanishads in shaping Indian philosophical thought.
5. Discuss the unity in diversity within Indian philosophy. How do the various schools differ yet maintain a common spiritual goal?
6. Evaluate the relationship between Indian philosophy and religion. Can Indian philosophy be called spiritual rather than materialistic?
7. "Indian philosophy is more introspective than analytical." Discuss with examples.
8. What is the significance of the concepts of Karma and Dharma in Indian philosophy?

PAPER NAME: CLOUD COMPUTING
PAPER CODE: PEC-CS 701B

1. Explain the NIST model and Cloud Cube model of cloud computing.
2. Write a short note on Identity as a Service (IDaaS) and Compliance as a Service (CaaS).
3. Discuss different types of virtualization: access, application, CPU, and storage.
4. Explain the major features of Google App Engine service.
5. What are the six stages of the lifecycle management of cloud services?

PAPER NAME: SOFT COMPUTING
PAPER CODE: PEC-CS 702B

1. Differentiate between Classical Sets and Fuzzy Sets with examples.
2. Explain operations on Classical Sets and properties of Classical Sets.
3. Differentiate between Classical AI and Neural Networks.
4. Explain Hebbian Learning, Competitive Learning, and Boltzmann Learning.
5. Explain Simulated Annealing and its applications.

B.TECH-7TH SEM-ECE-THEORY
PAPER NAME: PRINCIPLES OF MANAGEMENT
PAPER CODE: HS-HU701

1. What are the various objectives of planning?
2. Explain the benefits and weaknesses of MBO.
3. Describe any four quantitative techniques used for management decision-making?
4. Describe the principles and steps that constitute the organising process.
5. What are the bases for departmentation in a business organisation? State also the difficulties of delegation.
6. State the main causes of conflict between line and staff officials in an enterprise. How can they be removed?

PAPER NAME: ENTREPRENEURSHIP
PAPER CODE: OE-EC704C

1. Discuss about the Dearth of entrepreneurial talent in India.
2. Write a short note on – Sales Tax.
3. Discuss about the Break-Even Analysis.
4. Write a short note on – Value Added Tax(VAT).
5. Describe the Procedures to start SSIs.

PAPER NAME: MOBILE COMMUNICATION AND NETWORKING
PAPER CODE: PE-EC701C

1. What are the characteristics of a Mobile-communication system?
2. States the difference between AM and FM?
3. Describe different components of Bluetooth & ISDN systems.
4. What are the fundamental features of Softer & Hard Hand-off?
5. Explain working principle with neat diagram of a PSTN.

PAPER NAME:DIGITAL IMAGE & VIDEO PROCESSING
PAPER CODE: PE-EC702B

1. Explain the elements of visual perception and their importance in image processing.
2. Explain frequency-domain filtering: low-pass and high-pass filters with applications.
3. Write a note on color image segmentation and its applications.
4. Explain its importance in image processing.
5. What is the uncertainty principle of Fourier Transform? Explain with examples.

PAPER NAME: EMBEDDED SYSTEMS
PAPER CODE: PE-EC703A

4. What are the characteristics of Serial and Parallel communication Ports?
5. Explain different types of I/O ports in embedded systems.
3. Describe different components of ARM Processor?
4. What are the fundamental features of Interrupt-Latency?
5. Explain working principle with neat diagram for RTOS.

B.TECH-7TH SEM-EEE-THEORY
PAPER NAME: PRINCIPLE OF MANAGEMENT
PAPER CODE: HM-EEE 701

1. What are the various objectives of planning?
2. Explain the benefits and weaknesses of MBO.
3. Describe any four quantitative techniques used for management decision-making?
4. Describe the principles and steps that constitute the organising process.
5. What are the bases for departmentation in a business organisation? State also the difficulties of delegation.
6. State the main causes of conflict between line and staff officials in an enterprise. How can they be removed?

PAPER NAME: COMPUTER NETWORK
PAPER CODE: OE-EEE 701B

1. Explain the OSI and TCP/IP reference models. Compare them in terms of layers, functionalities, and protocols.
2. What are the different types of transmission media? Explain guided and unguided media with examples.
3. Describe the various error detection and correction techniques used in the data link layer.
4. Differentiate between TCP and UDP in terms of functionality, reliability, and usage scenarios.
5. What are congestion control techniques in the transport layer? Explain the Leaky Bucket and Token Bucket algorithms.

PAPER NAME:COMPUTER GRAPHICS
PAPER CODE: OE-EEE 702B

1. Differentiate between Active and Passive graphics devices with examples.
2. Explain the Digital Differential Analyzer (DDA) Line Drawing Algorithm with an example.
3. Explain Back Face Removal and Z-Buffer Algorithm for visible surface detection.
4. Explain Scan-Line Method and Painter's Algorithm (Depth Sorting)
5. Explain Light and Color Models in computer graphics.
6. Explain Interpolative Shading Models and their types.

PAPER NAME: ANALOG AND DIGITAL COMMUNICATION
PAPER CODE: PC-EEE 701

1 What are the characteristics of an Analog-communication system?
2 States the difference between DM and DPCM?
3 Describe different components of Cellular-communication Networking.
4 What are the fundamental features of Hand-off?
5 Explain working principle with neat diagram of GPRS Systems.

PAPER NAME: ELECTRIC DRIVE
PAPER CODE: PE-EEE 701A

1. What is Diversity Factor and Plant Capacity Factor ? Mention their mathematical expressions.
2. Short note on SRM Drives & Stepper Motor Drives.
3. Write a short note on : (i) Demand Factor (ii) Load Factor.
4. Comparison of the Control Methods of Induction Motor Drives.
5. Write down the different Industrial Applications of Electric Drives.
6. Write Various control strategies of Synchronous motor Drives.
7. Write short notes on the Solar and Battery Powered Drives.

B.TECH-7TH SEM-EEE-PRACTICAL
PAPER NAME: ANALOG AND DIGITAL COMMUNICATION LAB
PAPER CODE: PC-EEE 791

1. Measurement of modulation index of an AM signal.
2. Study of PCM & Demodulation
3. Study of PAM & Demodulation
4. Study of Delta Modulator & Demodulator
5. Design a FM demodulator using PLL.