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21/04/2026
BR23/BR20
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(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary End Examinations (BR23), APRIL-2026

ENGINEERING GEOLOGY (CE)

Time: 3 hours

Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1.a)	Define physical geology.	BL1	1	(2M)
b)	What is meandering.	BL1	1	(2M)
c)	List the uses of mineral quartz.	BL2	2	(2M)
d)	Define streak and cleavage.	BL1	2	(2M)
e)	What is strike slip fault.	BL1	3	(2M)
f)	Define conformity.	BL1	3	(2M)
g)	What are shield areas.	BL1	4	(2M)
h)	What are the limitations of magnetic method.	BL1	4	(2M)
i)	Define line of reservoir.	BL2	5	(2M)
j)	What is buttress dam.	BL1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Discuss the geological agents causing weathering.	BL3	1	(10M)

(OR)

3.(a)	Explain the development of river in young age.	BL2	1	(5M)
3.(b)	Discuss various main and allied branches of geology.	BL3	1	(5M)

UNIT-II

4(a)	Write the physical properties of minerals that are commonly used for there Identification.	BL1	2	(10M)

(OR)

5.(a)	Discuss the various textures of Sedimentary rocks with sketches.	BL4	2	(10M)

UNIT-III

6.(a)	Explain the types of folds with neat sketches.	BL2	3	(10M)

(OR)

7.(a)	Explain the importance of faults in civil engineering.	BL2	3	(10M)

UNIT-IV

8.(a)	Explain the factors affecting ground water movement.	BL2	4	(5M)

8.(b)	Discuss about cone of depression.	BL3	4	(5M)

(OR)

9.(a)	Explain the electrical resistivity method of geophysical investigation.	BL2	4	(10M)

UNIT-V

10(a)	Discuss the factors considered for selection of site for a dam.	BL3	5	(10M)

(OR)

11(a)	Discuss about the types of dams.	BL3	5	(10M)

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Course Code: 23CE4T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026

CONCRETE TECHNOLOGY (CE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is meant by maximum aggregate size?	1	1	(2M)
b)	List the sizes of sieves in sieve analysis of fine and coarse aggregates.	1	1	(2M)
c)	Explain about the mixing of concrete.	2	2	(2M)
d)	Define workability.	1	2	(2M)
e)	Define Durability of Concrete.	1	3	(2M)
f)	List out various NDT methods.	1	3	(2M)
g)	Define creep.	1	4	(2M)
h)	Define shrinkage.	1	4	(2M)
i)	Distinguish between the characteristic strength and target mean strength in concrete mix design.	2	5	(2M)
j)	What is cellular concrete?	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain briefly about gap grading of aggregates.	2	1	(5M)
2.(b)	Discuss the factors that promote Alkali-aggregate reaction.	2	1	(5M)
	(OR)			
3.	Classify the aggregates based on particle shape, size and texture.	2	1	(10M)
	UNIT-II			
4.(a)	List various methods for measuring workability of concrete and explain any one method in detail.	2	2	(5M)
4.(b)	Explain in brief about segregation and bleeding.	2	2	(5M)
	(OR)			
5.	Explain the various steps in manufacture of concrete	2	2	(10M)

UNIT-III

6.	Explain are the various techniques of Measuring Pulse Velocity in hardened concrete.	2	3	(10M)
	(OR)			
7.(a)	Discuss the factors effecting the strength of concrete in detail.	2	3	(5M)
7.(b)	What is the effect of water-cement ratio on the strength of concrete.	1	3	(5M)

UNIT-IV

8.(a)	Explain the factors influencing creep of concrete.	2	4	(5M)
8.(b)	Define shrinkage and explain the types of shrinkage.	2	4	(5M)
	(OR)			
9.	Explain modulus of elasticity and Dynamic modulus of elasticity.	2	4	(10M)

UNIT-V

10.	Design a concrete mix of M30 grade. Take standard deviation of 4 MPa. The specific gravity of course aggregate and fine aggregate are 2.72 and 2.60 respectively. The bulk density of course aggregate is 1600 kg/m^3 and fineness modulus of aggregate is 2.84. A slump of 100mm is necessary. The water absorption of course aggregate is 0.5% and free moisture in fine aggregate is 1%. Design the concrete mix by BIS method. Assume any suitable data.	4	5	(10M)
	(OR)			
11(a)	Explain about different types of polymer concrete.	4	5	(5M)
11(b)	Explain the tests for self consolidated concrete with neat sketches.	4	5	(5M)

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Course Code: 23CE4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/ Supplementary Examinations (BR23), APRIL-2026

STRUCTURAL ANALYSIS (CE)

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

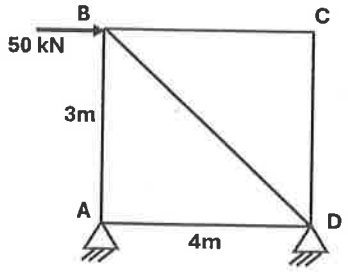
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	State Castigliano's theorem I.	1	1	(2M)
b)	Write the formula for strain energy due to axial load in a prismatic bar.	1	1	(2M)
c)	Write any two important assumptions made in the analysis of trusses.	1	2	(2M)
d)	What are the applications of Castigliano's theorem II?	1	2	(2M)
e)	A beam 8m long is fixed at its ends. It carries a uniformly distributed load of 5 kN/m over the whole span. Draw the bending moment diagram. Take E = 200KN/mm^2 and I = 5×10^7 mm^4.	2	3	(2M)
f)	What is the effect of fixed beam behavior if any one of the support sinks?	1	3	(2M)
g)	Write the generalized slope-deflection equation. Explain the terms.	1	4	(2M)
h)	What are the applications of slope deflection method?	1	4	(2M)
i)	What is flexural stiffness of a member?	1	5	(2M)
j)	Explain carryover moment if the far end is (a) simply support (b) fixed support	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Find the vertical and horizontal deflections of the joint C of the pin jointed truss shown in figure. The area of the horizontal member is 150 mm^2 and the areas of the members AC and BC are 200 mm^2 each. Take E=200 kN/mm^2.	**4**	1	(10M)

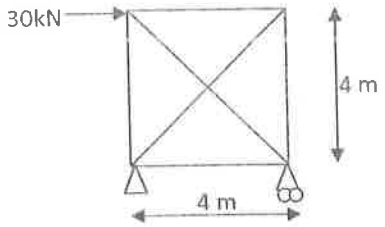


(OR)

3.(a)	Derive the strain energy expressions for body subjected to bending stresses and shear stresses.	**2**	1	(5M)
3.(b)	Formulate the expression for strain energy in a simply supported beam under a uniformly distributed load using bending moment diagrams.	**2**	1	(5M)
	UNIT-II			
4.(a)	Discuss in detail about static indeterminacy in structures.	2	2	(5M)
4.(b)	Explain the Castigliano's theorem II.	2	2	(5M)

(OR)

5.	Analyse the truss shown in figure	4	2	(10M)

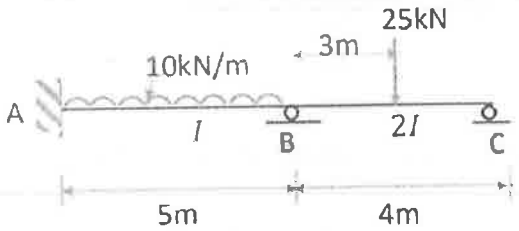


UNIT-III

6.	A fixed beam AB of span 8m carries concentrated loads of 120 kN and 70 kN at distances 3m and 5m from the left end A. Calculate the reactions and draw shear force and bending moment diagram.	4	3	(10M)
	(OR)			
7.(a)	Discuss the advantages and disadvantages of fixed beams.	2	3	(5M)
7.(b)	A continuous beam ABC covers two consecutive spans AB and BC of lengths 4m and 4m carrying uniformly distributed loads of 50 kN/m and 60 kN/m respectively. If the ends A and C are simply supported, draw the bending moment diagram.	2	3	(5M)

UNIT-IV

8.(a)	Explain the effect of support settlement on the slope-deflection method with suitable illustrations.	2	4	(5M)
8.(b)	Using slope-deflection method, determine the fixed-end moments for a beam AB of span 6 m carrying a uniformly distributed load of 20 kN/m. Both ends are fixed.	3	4	(5M)
	(OR)			
9.	Analyse the beam shown below using Slope deflection method and draw BMD.	4	4	(10M)



UNIT-V

10.	A continuous beam ABC is fixed at A and simply supported at B and C. AB and BC are 4m and 6m in length. The spans AB and BC carry point loads 5kN and 15kN at the respective midspans. Find the bending moment diagram and. Use moment distribution method.	4	5	(10M)
	(OR)			
11(a)	A beam AB of span 5m fixed at A and simply supported at B carries a point load of 10kN at mid span. Find the support moment and draw bending moment diagram.	3	5	(5M)
11(b)	Explain (i) Carryover moment (ii) Distribution factor	2	5	(5M)

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(BR23) 28/04/2026

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Course Code: 23CE4T03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2026
HYDRAULICS & HYDRAULIC MACHINERY (CE)

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A(10X2= 20M)

PART-A

		Marks	CO	BL
1.a)	Define viscosity and viscous Flow.	2M	1	L2
b)	What is moody's diagram?	2M	1	L1
c)	Define open channel flow and pipe flow.	2M	2	L2
d)	Define steady and unsteady flow	2M	2	L2
e)	Define the term specific energy of a flowing liquid.	2M	3	L2
f)	What is specific energy curve?	2M	3	L1
g)	Define the terms (a) Hydraulic machines (b) Turbines.	2M	4	L2
h)	What do you mean by gross head, net head and efficiency of turbine?	2M	4	L1
i)	Define a centrifugal pump.	2M	5	L2
j)	Define the terms: suction head, delivery head.	2M	5	L2

PART–B(5X10=50M)

		Marks	CO	BL
	UNIT-I			
2 a.	Derive Hagen Poiseuille's equation for laminar flow through h circular pipe.	5M	1	BL2
2 b.	A flat plate of 2m×2m moves with at 40km/hr in stationary air of density 1.25 kg/m^3.If the co-efficient of drag and lift are 0.2 and 0.8 respectively. Find (i) Lift Force (ii) Drag Force (iii) Resultant Force.	5M	1	BL3
	OR			
3.a	Draw a neat sketch of the Reynolds apparatus and explain how the laminar Flow can be demonstrated with help of apparatus?	5M	1	BL4
3 b.	Discuss about Moody's diagram and its importance?	5M	1	BL4
	UNIT-II			
4.a	Write briefly about classification of flows.	5M	2	BL2
4 b.	Derive the conditions for most economical section of a rectangular channel analyze.	5M	2	BL3
	OR			

5.	Find the rate of flow of water through a triangular channel having the total angle between the sides as 60. Take the value of Manning's constant n=0.015 and the slope bed as 1m in 1km. The depth of flow is 1.6m.	10M	2	BL4
	UNIT-III			
6.a	Write the applications and types of hydraulic jumps.	5M	3	BL3
6 b.	Differentiate between critical, subcritical flows.	5M	3	BL2
	OR			
7 a	Deduce the dynamic equation for gradually varied flow.	5M	3	BL3
7 b.	A horizontal rectangular channel 4m wide carries a discharge of $16m^3$/sec. Determine whether a jump occur at a depth of 0.5m or not. If a jump occurs, determine the sequent depth to this initial depth. Also determine the energy loss in the jump.	5M	3	BL4
	UNIT-IV			
8 a.	Explain about turbines and write the functions of following parts of reaction turbine: (i) Guide blades (ii) Scroll casing (iii)Draft tube (iv)Runner	5M	4	BL2
8 b.	Define the term impact of jets and explain in detail stationary and movable jets with neat sketch.	5M	4	BL4
	OR			
9.	A nozzle outer diameter 55mm diameter delivers a stream of water at 25 m/sec perpendicular to plate that moves away from the jet at 8m/sec. Find the force on the plate, the work done , the efficiency of jet.	10M	4	BL3
	UNIT-V			
10 a.	Define a centrifugal pump. Explain the working of a single-stage centrifugal Pump with sketches.	5M	5	BL4
10 b.	What is the difference between single stage and multistage pumps?	5M	5	BL2
	OR			
11 a.	Explain about Pelton wheel turbine and write its applications.	5M	5	BL3
11 b.	The diameters of an impeller of a centrifugal pump at inlet and outlet are 20 cm and 40 cm respectively. Determine the minimum speed for starting the pump if it works against head of 25 m.	5M	5	BL4

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Course Code: 23HM4T03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS(CE,EEE,ECE,CSE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	List the factor governing demand forecasting.	BTL1	1	(2M)
b)	How does regression analysis aid demand forecasting?	BTL2	1	(2M)
c)	Distinguish fixed costs from variable costs in cost behavior.	BTL2	2	(2M)
d)	How the least-cost combination reduces production costs.	BTL2	2	(2M)
e)	How monopolistic competition differs from perfect competition.	BTL2	3	(2M)
f)	How an oligopoly affects pricing decisions.	BTL2	3	(2M)
g)	What is the Pay Back Period method in capital budgeting?	BTL2	4	(2M)
h)	Why is NPV considered a superior method for project evaluation?	BTL2	4	(2M)
i)	What do you mean by Accounting.	BTL2	5	(2M)
j)	Define the terms "Journal" and "Ledger" in the context of accounting.	BTL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Classify the various types of elasticity of demand with examples.	BTL2	1	(10M)
	(OR)			
3.(a)	Analyze how consumer preferences as a factor governing demand forecasting might lead to inaccurate predictions in the smartphone market.	BTL3	1	(5M)
3.(b)	Compare the revenue implications of raising prices for a product with elastic demand versus one with inelastic demand.	BTL3	1	(5M)
	UNIT-II			
4.(a)	Compare the significance of production functions for optimizing resource use ina capital-intensive industry (e.g., manufacturing) versus a labor-intensiveindustry (e.g., agriculture). Provide examples.	BTL3	2	(5M)
4.(b)	Differentiate between short-run and long-run production functions in terms of cost behavior and decision-making, using isoquants to illustrate.	BTL3	2	(5M)
	(OR)			
5.(a)	Calculate the break-even point (BEP) in units and dollars for a product with fixed costs of $15,000, a selling price of $120 per unit, and a variable cost of $80 per unit. Then, determine the sales volume needed to achieve a target profit of $5,000. Explain how these calculations guide strategic decisions for a new product launch.	BTL4	2	(10M)
	UNIT-III			
6.(a)	Briefly Explain the characteristics of a sole trade business. Discuss its merits and demerits.	BTL5	3	(10M)
	(OR)			
7.(a)	Differentiate between monopoly and monopolistic competition in terms of product differentiation and price-output determination, using real-world examples.	BTL3	3	(5M)
7.(b)	Examine the role of public sector enterprises versus partnerships in achieving social versus profit-oriented objectives, with examples of industries.	BTL4	3	(5M)

UNIT-IV

8.(a)	Differentiate between permanent and temporary working capital with examples. Apply your understanding to explain how a retail business can manage both types during peak seasons.	BTL3	4	(5M)
8.(b)	Compare and contrast the Pay Back Period and NPV methods in terms of their approach to project evaluation.	BTL2	4	(5M)

(OR)

9.(a)	What is capital budgeting? Discuss about the methods of capital budgeting.	BTL5	4	(10M)

UNIT-V

10.(a)	You require preparing journal entries in the books of Radha & Co? 1.1. 2023 Started business with cash Rs. 500000. • 4.1.2023 purchased goods from Krishna & Co Rs. 28000. • 6.1.2023 Cash purchases from Gokul & Co Rs. 32000. • 8.1.2023 Goods returned to Krishna & Co Rs. 2500. • 12.1.2023 sold goods to Murali & Co Rs. 65000. • 16.1.2023 cash sales Rs. 72000. • 20.1. 2023 Goods received from Murali & Co Rs. 3500. • 24.1. 2023 Machinery purchased RS. 22000. • 26.1. 2023 goods withdraw from business for personal purpose Rs. 5500. • 30.1. 2023 Salaries and rent paid Rs. 15000 and Rs. 4500.	BTL5	5	(10M)

(OR)

11(a)	What are the Functions of financing activity?	BTL2	5	(5M)
11(b)	Explain the role of double-entry bookkeeping in maintaining financial records. How does it ensure accuracy and completeness in financial reporting?	BTL3	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026

ANALOG CIRCUITS (EEE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Thermal Stability.	1	1	(2M)
b)	Define Diode Clamper.	1	1	(2M)
c)	Write the types of Feedback Amplifiers.	1	2	(2M)
d)	Define Feedback amplifier.	1	2	(2M)
e)	Write the 741 Op-Amp features.	1	3	(2M)
f)	Classify Oscillator.	2	3	(2M)
g)	Write any two applications of OP-Amp.	1	4	(2M)
h)	Draw the Diagram of Triangular Wave Generator.	2	4	(2M)
i)	Write the Difference between Monostable and A stable Multivibrator.	1	5	(2M)
j)	Write the DAC techniques.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Define Clippers and Classify the Clippers with brief explanation.	1	1	(10M)
	(OR)			
3.(a)	Draw and explain the circuit and operation of the collector to base bias configuration.	3	1	(5M)
3.(b)	Explain the Clamping Circuit operation.	2	1	(5M)
	UNIT-II			
4.(a)	Discuss about Current–Shunt feedback configuration in Feedback Amplifier.	2	2	(5M)
4.(b)	Determine the h-parameters of a transistor Circuit.	2	2	(5M)
	(OR)			

5.	Compare CE, CB, and CC amplifier configurations based on voltage gain and input/output impedance.	4	2	(10M)

UNIT-III

6.	Explain the operation of Crystal oscillator and Wein bridge oscillator.	2	3	(10M)

(OR)

7.(a)	Draw and explain the 741 Op-Amp.	2	3	(5M)
7.(b)	Explain the operation of RC phase shift oscillator.	2	3	(5M)

UNIT-IV

8.(a)	Explain the operation of Differential amplifier.	2	4	(5M)
8.(b)	Explain the Operation of Square wave generator with neat Sketch.	2	4	(5M)

(OR)

9.	Draw the circuit of log Amplifier using two op-amps and explain its operation.	2	4	(10M)

UNIT-V

10.	Explain the Operation of successive approximation ADC.	2	5	(10M)

(OR)

11(a)	Derive the expression of time delay of a monostable multivibrator.	1	5	(5M)
11(b)	Construct and Explain inverted R-2R DAC.	3	5	(5M)

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Course Code: 23EE4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026

POWER SYSTEMS -I (EEE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is the function of surge tank in hydro electric power plants.	1	1	(2M)
b)	What is the need of cooling towers in a thermal power station?	1	1	(2M)
c)	What are the materials used as control rods and shield in a nuclear reactor	1	2	(2M)
d)	Distinguish between nuclear fission and fusion.	2	2	(2M)
e)	What are the limitations of Indoor substation?	2	3	(2M)
f)	What are the merits of gas insulated substation over air insulated substation?	2	3	(2M)
g)	List the advantages of under ground cable system compared to overhead transmission system.	1	4	(2M)
h)	Discuss why loss angle of power cable is very low.	2	4	(2M)
i)	Define annual plant capacity factor.	1	5	(2M)
j)	Enumerate the significance of load duration curve	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	What are the essential requirements of steam power station design?	1	1	(10M)
	(OR)			
3.(a)	State the factors governing the selection of site for hydro electric power plant.	2	1	(5M)
3.(b)	Describe the functions of economizer and super heater in a thermal power plant.	2	1	(5M)
	UNIT-II			
4.(a)	Explain the importance of fast breeder reactor in nuclear power station.	2	2	(5M)
4.(b)	What are the basic components of nuclear reactor and explain the function of each component.	2	2	(5M)
	(OR)			
5.	Explain about radiation hazards and shielding in nuclear power plants. Discuss the process of waste disposal in nuclear power plant.	2	2	(10M)

UNIT-III

6.	What are the various factors considered for selecting a particular 33/11kv substation? With a neat diagram explain briefly.	2	3	(10M)
	(OR)			
7.(a)	Explain the general maintenance requirements of a Gas – Insulated Substation.	2	3	(5M)
7.(b)	Discuss the process of substation site selection process.	2	3	(5M)

UNIT-IV

8.(a)	Calculate the insulation resistance of a single core cable of inside diameter 0.03metre, outside diameter 0.075m and length 2 km, the resistivity of the insulating material being 6×10^{12} ohm meter.	3	4	(5M)
8.(b)	Derive the expression for electrostatic stress in a single core cable. Where does maximum stress occur and where is it minimum?	4	4	(5M)
	(OR)			
9.	Show that in a 1-core (belted type) cable the neutral capacitance of each conductor Cn is equal, where Cs and Cc are the capacitances of each conductor to sheath and to each other respectively. Explain the experimental procedure for measuring these capaciatnces.	4	4	(10M)

UNIT-V

10.	The yearly load duration curve of a certain power station can be approximated as a straight line the maximum and minimum loads being 80MW and 40 MW respectively. Three alternator units, two rated at 20 MW each and at 10 MW are installed to meet this load. Calculate (i) Installed capacity (ii) Load factor (iii) Plant factor (iv) kWh generated per year.	3	5	(10M)
	(OR)			
11(a)	Describe different types of tariffs commonly used in practice.	2	5	(5M)
11(b)	The daily demands of three consumers are given below. Determine the diversity factor and load factor.	3	5	(5M)

Time	Consumer 1	Consumer 2	Consumer 3
12 midnight to 8 A.M	No load	200 W	No load
8 A.M to 2 P.M	600 W	No load	200 W
2 P.M to 4 P.M	200 W	1000 W	1200 W
4 P.M to 10 P.M	800 W	No load	No load
10 P.M to Midnight	No Load	200 W	200 W

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Course Code: 23EE4T06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2026
INDUCTION & SYNCHRONOUS MACHINES (EEE)

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Write any two differences between squirrel-cage and slip-ring induction motor.	1	1	(2M)
b)	The frequency of the EMF in the stator of a 4 pole induction motor is 50Hz, and that in the rotor is 2 Hz. What is the slip, and at what speed is the motor running.	1	1	(2M)
c)	What is the torque value of 3-phase induction motor, if it is rotated with synchronous speed?	1	2	(2M)
d)	What is the drawback in the Direct On-Line (DOL) starter for starting of 3-phase induction motor?	1	2	(2M)
e)	List the types of 1-phase induction motors.	1	3	(2M)
f)	Draw the equivalent circuit of capacitor start capacitor run induction motor.	2	3	(2M)
g)	Define voltage regulation of an alternator.	1	4	(2M)
h)	Calculate pitch factor for the winding of 36 slots, 4 poles, and coil span 1 to 8.	1	4	(2M)
i)	Explain about the hunting of synchronous motor.	2	5	(2M)
j)	What is the speed regulation of the synchronous motor?	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	A 6-pole, 50 hz, 3-phase induction motor running at full load and develops a useful torque of 150N-M at a rotor frequency of 1.5 hz, the mechanical torque lost due to friction is 10N-M. Calculate the i) shaft power output ii) Rotor copper losses iii) Efficiency of the motor.	4	1	(10M)
	(OR)			
3.	With a neat sketch explain the generation of rotating magnetic field in the 3-phase induction motor.	2	1	(10M)
	UNIT-II			
4.(a)	Derive the torque equation of the 3-phase induction motor, also draw torque-slip characteristics.	4	2	(5M)
4.(b)	List the speed control methods of 3-phase induction motor, explain about any one method.	1	2	(5M)
	(OR)			
5.	The short circuit current of SCIM on normal voltage is 3 times the full load current and the full load slip is 4%. Determine the percentage tapping required to an autotransformer starter to start the motor against 1/3rd full load torque. Neglect magnetizing current	3	2	(10M)

UNIT-III

6.	A 220V, 1-phase induction motor gave the following test results No-load test: 200V, 4.5A, 120W; Blocked rotor test: 120V, 9.6A, 460W The stator winding resistance is 1.5Ω, and during the blocked rotor test the starting winding is open. Determine the equivalent circuit parameters, friction and windage losses.	3	3	(10M)

(OR)

7.(a)	Define slip, what is the slip of the induction motor at standstill condition, and at synchronous speed.	2	3	(5M)
7.(b)	With neat sketch explain about double field revolving theory of induction motor.	2	3	(5M)

UNIT-IV

8.(a)	With a neat sketch explain the construction of alternator.	2	4	(5M)
8.(b)	List the advantages of stationary armature winding, why armature winding is short pitched.	1	4	(5M)

(OR)

9.	Two identical 3 MVA alternators are running in parallel. The frequency drops from no load to full load for the two alternators are 50Hz to 47 Hz and 50Hz to 48Hz respectively (i) How will they share a load of 4000 kW (ii) (ii) what is maximum load they can share at unity power factor without overloading any alternator	4	4	(10M)

UNIT-V

10.	A 400 V, 50 Hz, 33.7 kW, 3 phase star connected synchronous motor has a full load efficiency of 88%. The synchronous impedance of the motor is (0.2+j1.6) Ω/ph. If the excitation of the motor is adjusted to give a leading p.f of 0.9, Calculate induced emf developed for full load?	3	5	(10M)

(OR)

11(a)	Write the operating principle of synchronous motor, why it is not self-started.	2	5	(5M)
11(b)	Derive the mechanical power developed by the synchronous motor.	3	5	(5M)

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Course Code: 23EE4T07

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2026

CONTROL SYSTEMS (EEE)

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

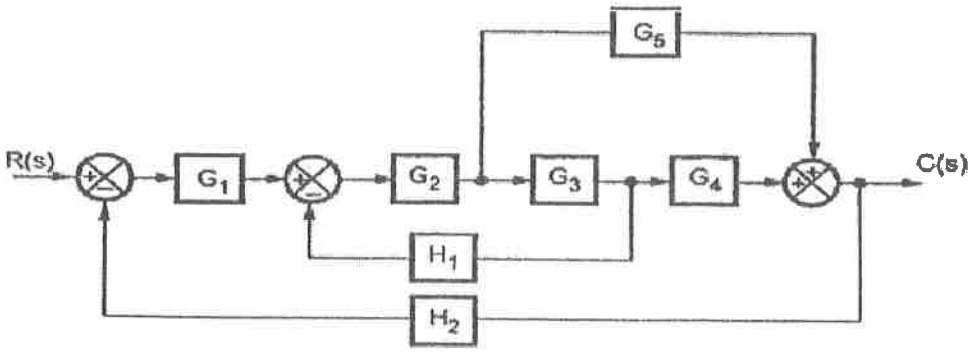
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define transfer function of Control systems.	1	1	(2M)
b)	Mention the elements in mechanical rotational systems.	1	1	(2M)
c)	Define Peak time and Write the formula?	2	2	(2M)
d)	Mention the limitations of Routh's stability criterion.	1	2	(2M)
e)	Mention the advantages of frequency response analysis.	1	3	(2M)
f)	Define phase margin from Bode plot.	2	3	(2M)
g)	Draw the pole-zero plot of the lead compensator.	1	4	(2M)
h)	What is a Phase Lag compensator and why is it used?	1	4	(2M)
i)	What are the advantages of state space analysis?	2	5	(2M)
j)	Mention the properties of state transition matrix.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Determine the overall transfer function relating C and R for the system whose block diagram is given as below.	4	1	(10M)



(OR)

3.(a)	Explain open loop & closed loop control systems by giving suitable examples & also mention their merits & demerits?	2	1	(5M)
3.(b)	Illustrate at least three applications of feedback control systems.	2	1	(5M)

UNIT-II

4.(a)	Briefly explain about various standard test signals.	2	2	(5M)
4.(b)	By Using Routh criterion, determine the stability of the system having the characteristic equation as $S^4+21S^3+21S^2+36S+20=0$	3	2	(5M)

(OR)

5.	A unity feedback controls sytemhas the open loop transfer functioon as, $G(s) = \frac{K}{S(S^2+4S+13)}$. Sketch he root locus.	4	2	(10M)

UNIT-III

6.	Sketch polar plot for a system with unity feedback and determine gain margin, phase margin if the system having open loop transfer function as, $G(S)= \frac{1}{S(1+S)(1+2S)}$	4	3	(10M)

(OR)

7.(a)	Define the following terms i) Gain cross over frequency ii)Resonant peak iii)Resonant frequency iv)Band width	2	3	(5M)
7.(b)	Explain the steps for the construction of Bode plot and also mention the advantages of Bode Plot.	2	3	(5M)

UNIT-IV

8.(a)	Draw the electrical circuit diagram that represents the Lead compensator and explain in detail.	2	4	(5M)
8.(b)	Explain the procedural steps to design a phase lag compensator using Bode analysis.	2	4	(5M)

(OR)

9.	Design a phase lag network for a system having $G(s)= K/[s(1+0.2s)^2]$ to have a phase margin of 30^0.	3	4	(10M)

UNIT-V

10.	Obtain the transfer function from the below given state equation.	3	5	(10M)

$$\begin{pmatrix}\dot{X}_1\\ \dot{X}_2\end{pmatrix} = \begin{pmatrix}-2 & -3\\ 4 & 2\end{pmatrix}\begin{pmatrix}X_1\\ X_2\end{pmatrix} + \begin{pmatrix}3\\ 5\end{pmatrix} U \text{ and } Y = \begin{pmatrix}1 & 1\end{pmatrix}\begin{pmatrix}X_1\\ X_2\end{pmatrix}$$

(OR)

11(a)	State and explain controllability and observability.	2	5	(5M)
11(b)	Distinguish between Transfer function model and State Space model.	2	5	(5M)

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Course Code: 23BS4T10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2026

COMPLEX VARIABLES PROBABILITY & STATISTICS (ME)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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NOTE: Provide Statistical tables

PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define harmonic function.	1	1	(2M)
b)	Find the value of $\int_C \frac{dz}{z-a}$ where C is the circle $\|z-a\| = r$	2	1	(2M)
c)	Expand $Cos\,z$ in Taylor's series about the point $z = \frac{\pi}{4}$	2	2	(2M)
d)	State Cauchy Residue theorem.	1	2	(2M)
e)	The probability density function of a variable X is X: 0 1 2 3 4 5 6 p(x): k 3k 5k 7k 9k 11k 13k Find the value of k	1	3	(2M)
f)	What is mean and variance of binomial distribution.	1	3	(2M)
g)	Define population and sample.	1	4	(2M)
h)	State Central limit theorem.	1	4	(2M)
i)	Define null hypothesis and alternate hypothesis.	1	5	(2M)
j)	Discuss the uses of chi-square test.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Determine the conjugate harmonic and analytic function whose real part is $x^3 - 3xy^2 + 3x^2 - 3y^2 + 1$	3	1	(10M)
	(OR)			
3.(a)	Evaluate $\int_C (z - z^2)dz$ where C is the upper half of the circle $\|z\| = 1$.	3	1	(5M)
3.(b)	Evaluate $\int_C \frac{\log z}{(z-1)^3} dz$ Where C: $\|z-1\| = \frac{1}{2}$, using Cauchy's integral formula.	3	1	(5M)
	UNIT-II			
4.	Evaluate $\int_C \frac{1-2z}{z(z-1)(z-2)} dz$ where c is $\|z\| = 1.5$ by Residue theorem.	3	2	(10M)
	(OR)			
5.	Evaluate $\int_{-\infty}^{\infty} \frac{x^2 dx}{(x^2+1)(x^2+4)}$ using contour integration.	4	2	(10M)

UNIT-III

6.	In a bolt factory machines A, B, C manufacture 20%, 30% and 50% of their outputs and out of which 6%, 3% and 2% are defective. A bolt is drawn at random and is found to be defective. What is the probability that it is manufactured by machine A.	3	3	(10M)

(OR)

7.(a)	If the probability density function of a random variable is given by $f(x) = k(1-x^2)$ *if* $0 \le x \le 1$ $= 0$ *elsewhere* Find the value of k and the probabilities that a random variable will take on a value (i) between 0.1 and 0.2 (ii) Mean (iii) Variance.	3	3	(5M)
7.(b)	If a random variable has a Poisson distribution such that P(x = 1) = P(x = 2). Then find a) mean b) P(x=4) c) P(1<x<4)	2	3	(5M)

UNIT-IV

8.(a)	A random sample of size 144 is taken form an infinite population having the mean 75 and variance 225. What is the probability that the means will lie between 72 and 77.	2	4	(5M)
8.(b)	A sample of 11 rats from a central population had an average blood viscosity of 3.92 with a standard deviation of 0.61. Estimate the 95% confidence limits for the mean blood viscosity of the population.	2	4	(5M)

(OR)

9.	A population consists of five numbers 2, 3, 6, 8, 11. Consider all possible samples of size two which can be drawn without replacement from the population. Find (i) the mean of the population (ii) Standard deviation of the population (iii) the mean of the sampling distribution of means (iv) standard deviation of the sampling distribution of the means.	3	4	(10M)

UNIT-V

10.	A die is thrown 264 times with the following results.	3	5	(10M)

No. appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

Would you say that the die is biased on the basis of the chi-square test?

(OR)

11(a)	The heights of 6 randomly chosen sailors are 63, 65, 68, 69, 71, 72 inches. Those of 10 randomly chosen soldiers are 61, 62, 65, 66, 69, 69, 70, 71, 72, 73 inches. Discuss whether this data gives suggestion that the sailors are taller than soldiers.	3	5	(5M)
11(b)	A trucking firm is suspicious of the claim that the average life time of certain tyres is at least 28,000 miles. To check this claim the firm puts 40 of these tyres on its trucks and gets a mean life time of 27,468 miles with a standard deviation of 1,348 miles. What can we conclude if the probability of type I error is to be at most 0.01?	3	5	(5M)

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Course Code: 23ME4T03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026

MANUFACTURING PROCESSES (ME)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define casting & list Its Applications.	BL1	1	(2M)
b)	Define pattern allowances.	BL2	1	(2M)
c)	Define Welding.	BL1	2	(2M)
d)	Give any two advantages of MIG welding.	BL2	2	(2M)
e)	Define hot working.	BL1	3	(2M)
f)	List out the materials used for cold working.	BL1	3	(2M)
g)	Define Shet metal Blanking operation.	BL2	4	(2M)
h)	What are the various types of special forming operations?	BL2	4	(2M)
i)	What are the materials used for additive manufacturing?	BL2	5	(2M)
j)	What is a semiconductor?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain the steps involved in casting process with a neat sketch.	BL2	1	(10M)
	(OR)			
3.(a)	Explain Advantages and applications of Casting.	BL2	1	(5M)
3.(b)	Explain various Casting defects.	BL2	1	(5M)
	UNIT-II			
4.(a)	Explain the flame characteristics of gas welding process with a neat sketch.	BL3	2	(5M)
4.(b)	Explain TIG welding process with a neat sketch.	BL2	2	(5M)
	(OR)			
5.	Explain Thermite welding process with a neat sketch.	BL3	2	(10M)

UNIT-III

6.	What is hot working. Differentiate between hot working and cold working.	BL2	3	(10M)

(OR)

7.(a)	Explain rolling of metals with a neat sketch.	BL3	3	(5M)
7.(b)	Explain the Advantages and Limitations of tube extrusion.	BL2	3	(5M)

UNIT-IV

8.(a)	Explain various sheet metal operations with a neat sketch.	BL2	4	(5M)
8.(b)	Explain Spring back?	BL2	4	(5M)

(OR)

9.	Explain the High energy rate forming processes with a neat sketch.	BL2	4	(10M)

UNIT-V

10.	Explain the steps in additive manufacturing process with neat sketch.	BL2	5	(10M)

(OR)

11(a)	Explain about direct energy deposition AM processes.	BL2	5	(5M)
11(b)	Write advantages and types of Materials used in AM processes.	BL2	5	(5M)

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Course Code:23ME4T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026
FLUID MECHANICS & HYDRAULIC MACHINES (ME)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define units of viscosity.	BTL1	1	(2M)
b)	Define surface tension.	BTL1	1	(2M)
c)	Define free vortex flow with examples.	BTL1	2	(2M)
d)	Define Euler's equation of motion.	BTL1	2	(2M)
e)	Define Laminar Sub-layer.	BTL1	3	(2M)
f)	What is dimensional homogeneity?	BTL1	3	(2M)
g)	Define Impact of Jet.	BTL1	4	(2M)
h)	Define various types of turbines.	BTL1	4	(2M)
i)	Define water hammer.	BTL1	5	(2M)
j)	What is slip of Reciprocating pump?	BTL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Determine the expression for pressure difference in U-tube differential manometer.	BTL2	1	(10M)
	(OR)			
3.(a)	Define analytical method for Meta-Centre height.	BTL2	1	(5M)
3.(b)	A block of wood of specific gravity 0.7 floats in water. Determine the meta-centric height of the block if its size is 2m x 1m x 0.8 m.	BTL3	1	(5M)
	UNIT-II			
4.(a)	A pipe of diameter 400 mm carries water at a velocity of 25 m/s. The pressures at the points A and B are given as 29.43 N/cm^2 and 22.563 N/cm^2 respectively while the datum head at A and B are 28 m and 30 m. Find the loss of head between A and B.	BTL3	2	(5M)
4.(b)	An oil of sp. gr. 0.8 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take $C_d = 0.98$.	BTL3	2	(5M)
	(OR)			
5.	Derive Bernoulli is equation from Eelers equation of motion along a stream tube and mention their assumptions.	BTL3	2	(10M)
	UNIT-III			
6.	Find the boundary layer thickness at the end of the plate and the drag force on one side of a plate 1 m long and 0.8 m wide when placed in water flowing with a velocity of 150 mm per second. Calculate the value of co-efficient of drag also. Take μ for water = 0.01 poise.	BTL3	3	(10M)
	(OR)			

7.(a)	Find the expression for the drag force using Rayleigh's method on smooth sphere of diameter D, moving with a uniform velocity V in a fluid of density ρ and dynamic viscosity μ.	BTL3	3	(5M)
7.(b)	Explain Buckingham's π-Theorem.	BTL3	3	(5M)
	UNIT-IV			
8.(a)	Find the force exerted by a jet on stationary inclined flat plate.	BTL3	4	(5M)
8.(b)	A nozzle of 50 mm diameter delivers a stream of water at 20 m/s perpendicular to a plate that moves away from the jet at 5 m/s. Find: (i) The force on the plate, (ii) the work done, and (iii) the efficiency of jet.	BTL3	4	(5M)
	(OR)			
9.	Explain the construction and working of Kaplan Turbine with neat sketch.	BTL3	4	(10M)
	UNIT-V			
10.	Explain about hydraulic ram and lift.	BTL3	5	(10M)
	(OR)			
11(a)	Explain about functions of multistage centrifugal pumps with neat sketches.	BTL3	5	(5M)
11(b)	Explain ideal indicator diagram of a reciprocating pump.	BTL3	5	(5M)

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Course Code: 23ME4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026
THEORY OF MACHINES (ME)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is a mechanism? How does it differ from a machine?	BTL2	1	(2M)
b)	What is a universal joint? Where is it used?	BTL1	1	(2M)
c)	What is an instantaneous center of rotation?	BTL1	2	(2M)
d)	What is the Coriolis component of acceleration?	BTL1	2	(2M)
e)	What is the principle of a gyroscope?	BTL1	3	(2M)
f)	What is an epicyclic gear train?	BTL1	3	(2M)
g)	What are the common methods used for balancing several rotating masses?	BTL2	4	(2M)
h)	Define the terms "pressure angle" and "undercutting" in cam design.	BTL1	4	(2M)
i)	What is meant by free natural vibrations in a system?	BTL1	5	(2M)
j)	What is the function of a flywheel in a punching press?	BTL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Describe in detail the construction, working, and application of a universal joint. Also explain how angular velocity varies during rotation.	BTL2	1	(10M)
	(OR)			
3.(a)	Describe any two types of straight-line motion mechanisms.	BTL2	1	(5M)
3.(b)	Describe the working of a Whitworth quick return mechanism. What are its applications?	BTL3	1	(5M)
	UNIT-II			
4.	Derive expressions for tangential and radial components of acceleration for a point on a rotating link.	BTL2	2	(10M)
	(OR)			
5.	A crank OA rotates at a uniform speed of 30 rad/s. A slider B moves along a slotted link AC that rotates with OA. The radial distance from A to B is 0.2 m. The slider moves outward at a speed of 0.5 m/s. Calculate the Coriolis acceleration acting on the slider.	BTL3	2	(10M)
	UNIT-III			
6.	In an epicyclic gear train, the sun gear has 30 teeth, the planet gear has 60 teeth, and the ring gear has 120 teeth. The sun gear rotates at 200 rpm in a clockwise direction. Calculate the speed of the planet gear and the ring gear. Assume the planet gear is fixed to the carrier.	BTL3	3	(10M)
	(OR)			

7.(a)	Discuss the effect of a gyroscope on the stability of an aeroplane during a turn. How does the gyroscopic effect influence the control of the aircraft?	BTL3	3	(5M)
7.(b)	Describe the differences between spur gears and helical gears. Discuss their applications and the advantages of using helical gears over spur gears.	BTL3	3	(5M)

UNIT-IV

8.(a)	Explain the need for balancing rotating masses in machinery. Discuss the consequences of unbalanced rotating masses on the performance of the system.	BTL2	4	(5M)
8.(b)	A cam is designed to produce simple harmonic motion in the follower. The lift of the follower is 60 mm, and the cam angle is 180°. Calculate the velocity and acceleration of the follower at different positions (say at 30°, 60°, 90°, etc.). Plot the displacement, velocity, and acceleration diagrams.	BTL3	4	(5M)

(OR)

9.	A cam is designed to produce cycloidal motion with the following specifications: Follower lift = 40 mm, Cam angle = 120°. Calculate the displacement of the follower at 10° intervals during the rise and fall. Plot the displacement, velocity, and acceleration diagrams. Discuss the advantages of using cycloidal motion in cam design.	BTL3	4	(10M)

UNIT-V

10.	A four-stroke engine operates at 1000 rpm and delivers a maximum turning moment of 1500 N-m and a minimum turning moment of 400 N-m. The engine has a power output of 75 kW. Calculate the flywheel mass required to limit the fluctuation of speed to 5% of the mean speed. Assume the engine operates as a single-cylinder engine. Use the turning moment diagram to determine the necessary flywheel capacity.	BTL3	5	(10M)

(OR)

11.	Explain the longitudinal, transverse and torsional vibrations in detail.	BTL2	5	(10M)

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Course Code: **23HM4T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supply Examinations (BR23), April-2026

INDUSTRIAL MANAGEMENT (ME)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Differences between production management and industrial engineering.	4	1	(2M)
b)	Explain Y theory.	2	1	(2M)
c)	What are Ergonomies and its applications?	3	2	(2M)
d)	Define Work factor system and where it is used.	2	2	(2M)
e)	What is Total Quality Management and what are its benefits?	2	3	(2M)
f)	Explain how quality circles are formed.	2	3	(2M)
g)	What is Working capital and how it is useful?	2	4	(2M)
h)	What is Cost accounting and why it is necessary?	2	4	(2M)
i)	Explain Job evaluation.	2	5	(2M)
j)	Write Supply Chain Management applications.	3	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2(.a)	Explain Henry fayol's principles of management.	2	1	(10M)
	(OR)			
3.(a)	Discuss factors governing location of organization.	2	1	(10M)

UNIT-II

4.(a)	State different types of production functions and briefly discuss each of them.	2	2	(10M)
	(OR)			
5.(a)	Explain various charts and diagrams used in method study.	2	2	(10M)

UNIT-III

6.(a)	What is quality control and explain the importance of quality assurance in manufacturing,	2	3	(5M)
6.(b)	Discuss the principles of ergonomics.	2	3	(5M)
	(OR)			
7.(a)	Explain the concept of Therbling its 18 indications.	2	3	(10M)

UNIT-IV

8.(a)	Explain what are the sources of finance.	2	4	(5M)
8.(b)	Write the procedure related to estimation of working capital requirement.	2	4	(5M)

(OR)

9.(a)	Explain how Investment evaluation criteria is used is assessing the credibility of a company.	4	4	(10M)

UNIT-V

10(a)	Explain personal management and how industrial relation plays the critical role in it.	2	5	(10M)

(OR)

11(a)	Explain how value engineering plays an important role in reducing the costs of a firm.	4	5	(5M)
11(b)	What is supply chain management? Discuss about the elements of it.	2	5	(5M)

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Course Code: 23ES4T14

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026

LINEAR CONTROL SYSTEMS (ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

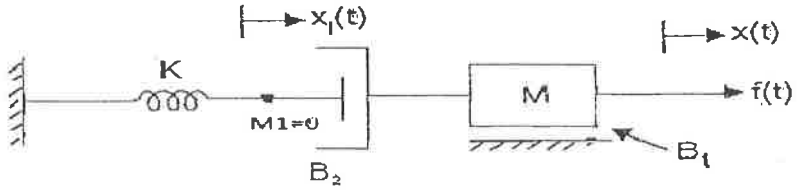
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define the transfer function of a system and list its limitations.	L2	1	(2M)
b)	Explain the effect of feedback on the gain of a control system.	L2	1	(2M)
c)	Describe the procedure for handling take-off points in block diagram reduction.	L2	2	(2M)
d)	What are the standard test signals used in control systems?	L1	2	(2M)
e)	How the roots of characteristic equation are related to stability?	L2	3	(2M)
f)	What are effects of adding zero to G(s) H(s) on the root loci?	L2	3	(2M)
g)	What are the frequency domain specifications?	L2	4	(2M)
h)	What is Bode plot?	L1	4	(2M)
i)	Define state transition matrix?	L1	5	(2M)
j)	What is controllability?	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Write the differential equations governing the Mechanical system shown in fig. and determine the transfer function	L3	1	(10M)

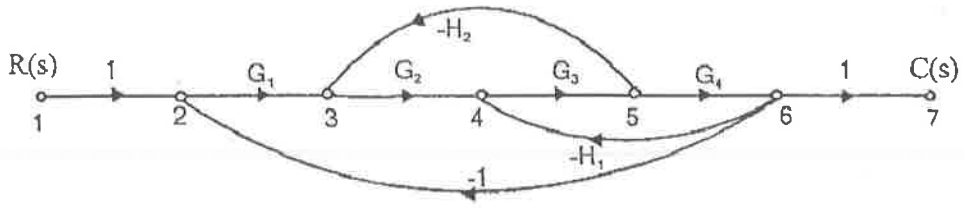


(OR)

3.(a)	Explain open loop control system and closed loop control system with example.	L1	1	(5M)
3.(b)	What are the basic components of a control system? Explain each with a neat diagram.	L2	1	(5M)

UNIT-II

4.	Determine the transfer function of the given signal flow graph using Mason's Gain Formula.	L3	2	(10M)



(OR)

5.(a)	Derive expressions for peak time and settling time of second order system for unit step input.	L3	2	(5M)
5.(b)	Determine damping factor,percentage peak overshoot, rise time (*tr*), peak time (*tp*) and settling time (*ts*) for the below system with transfer function as $G(S)= 100/(S^2+8S+100)$.	L4	2	(5M)

UNIT-III

6.	Construct Routh array, determine stability and find the location of roots for the systems represented by the following characteristic equations. $S^5+4S^4+8S^3+8S^2+7S+4=0$.	L2	3	(10M)

(OR)

7.	Sketch the Root Locus for the unity feedback system whose open loop transfer function is $G(s).H(s) = \frac{K}{S(S^2+6S+10)}$.	L3	3	(10M)

UNIT-IV

8.	Draw the Nyquist plot for the closed loop system, whose open-loop transfer function is given as $G(s) = \frac{K}{S(S+1)(S-1)}$.	L3	4	(10M)

(OR)

9.	Plot the Bode Plot for the following transfer function and obtain gain and phase crossover frequencies, $G(s) = \frac{75(1+0.2S)}{S(S^2+16S+100)}$.	L2	4	(10M)

UNIT-V

10.	What is the need for lead compensator? Derive its transfer function and alsodraw the bode plot.	L3	5	(10M)

(OR)

11(a)	Define the following terms with respect to phase variable approach i) State, ii) State variable, iii) state model and iv) State equations.	L2	5	(5M)
11(b)	Obtain the state model of the system described by the transfer function. $\frac{Y(S)}{U(S)} = \frac{1}{(S^3+5S+6)}$.	L3	5	(5M)

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Course Code: 23EC4T03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU

(AUTONOMOUS)

II B.Tech II Semester Regular/Supply End Examinations (BR23), APRIL-2026

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES (ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is the purpose of π-equivalent circuit?	L2	1	(2M)
b)	State the condition for a distortion less line.	L4	1	(2M)
c)	What is the value of the reflection coefficient for a matched line?	L2	2	(2M)
d)	Mention any three example of UHF transmission line.	L4	2	(2M)
e)	What is the relation between electric flux density **D** and electric field **E**?	L5	3	(2M)
f)	Write Laplace's equation.	L2	3	(2M)
g)	Write the force between two parallel current-carrying conductors.	L2	4	(2M)
h)	State Faraday's Law of electromagnetic induction.	L4	4	(2M)
i)	Define polarization and List its types.	L2	5	(2M)
j)	What is the critical angle for total internal reflection?	L2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Define primary constants and secondary constants of a transmission line. Derive expressions for:A)Characteristic impedance (Z_0) B)Propagation constant ($\gamma = \alpha + j\beta$)	**L5**	1	(10M)
	(OR)			
3.(a)	Define phase and group velocities in transmission line and derive the relation between them?	**L5**	1	(5M)
3.(b)	A lossy cable which has R=2.25Ω/m, L =1μH/m, c=1pF/m and G=0 operates at f=0.5GHz.Find Attenuation constant of line.	**L3**	1	(5M)

UNIT-II

4.(a)	Derive the relationship between Voltage Standing Wave Ratio (VSWR) and the magnitude of the reflection coefficient. What is the significance of VSWR?	L5	2	(10M)
	(OR)			
5.(a)	A transmission line has $Z_0 = 50\ \Omega$ and is terminated with $Z_l = 25 + j50\ \Omega$. Design a single stub matching network using the Smith chart.	L6	2	(10M)

UNIT-III

6.(a)	Derive the expression for energy stored in an electrostatic field and hence find the energy density.	L5	3	(10M)
	(OR)			
7.(a)	Derive the expression for the capacitance of a parallel plate capacitor with dielectric between the plates.	L5	3	(5M)
7.(b)	A parallel plate capacitor with area = 0.5 m^2, plate separation = 2 mm, and $\varepsilon r = 5$ is connected to 200 V. Calculate capacitance, charge, and energy stored.	L3	3	(5M)

UNIT-IV

8.(a)	State and explain the Biot-Savart Law. Derive the expression for magnetic field due to a current-carrying circular loop at a point on its axis.	L2	4	(5M)
8.(b)	State and Explain Faraday's Law In Electro Magnetic Induction.	L3	4	(5M)
	(OR)			
9.(a)	Write the Maxwell's equations in differential forms and also write the word Statements of Maxwell's equation and explain.	L4	4	(10M)

UNIT-V

10(a)	Derive the reflection and transmission coefficients for a normally incident plane wave on a boundary between two perfect dielectrics.	L5	5	(10M)
	(OR)			
11(a)	Define the Poynting vector. What does it represent? Derive its expression for a time-harmonic wave in a lossless dielectric.	L2	5	(5M)
11(b)	Calculate the **Brewster angle** for a wave travelling from air (n_1=1) to glass (n_2=1.5)	L3	5	(5M)

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Course Code: 23EC4T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), April-2026
ELECTRONIC CIRCUIT ANALYSIS (ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define hybrid-π model in the context of high-frequency analysis of BJTs?	BTL1	1	(2M)
b)	What is the significance of gain-bandwidth product in high-frequency amplifier design?	BTL2	1	(2M)
c)	Define Multistage amplifier and provide any two applications ?	BTL1	2	(2M)
d)	Compare the three types of coupling methods used in multistage amplifiers.	BTL2	2	(2M)
e)	What is meant by negative feedback in an amplifier?	BTL1	3	(2M)
f)	An amplifier has an open-loop gain of 100 and a feedback factor of 0.05. Find out the closed-loop gain.	BTL2	3	(2M)
g)	A Colpitt's oscillator uses C_1 = 100 pF, C_2 = 100 pF, and L = 10 μH. Find the frequency of oscillation.	BTL2	4	(2M)
h)	Mention two factors that affect frequency stability in oscillators?	BTL2	4	(2M)
i)	Draw the class A power Amplifier graphical representation.	BTL2	5	(2M)
j)	What is meant by complementary symmetry in push-pull amplifiers?	BTL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Analyze the complete high-frequency hybrid-π model using conductance derivations.	BTL4	1	(10M)
	(OR)			
3.(a)	Derive the expression for current gain of a CE amplifier with a resistive load at high frequency.	BTL3	1	(5M)
3.(b)	Compare and contrast common source and common drain FET amplifier configurations in terms of their high-frequency behavior.	BTL4	1	(5M)
	UNIT-II			
4.(a)	Explain the operation of a cascode amplifier and identify how it improves bandwidth.	BTL3	2	(5M)
4.(b)	Analyze the performance of a Darlington pair amplifier and derive its input resistance.	BTL4	2	(5M)
	(OR)			
5.	Evaluate the suitability of different amplifier types (Darlington pair, Cascode, Bootstrap, Differential) for use in high input resistance applications.	BTL4	2	(10M)
	UNIT-III			
6.	Derive the expression for closed-loop gain of a feedback amplifier and explain the significance of each term. How does feedback improve gain stability?	BTL4	3	(10M)
	(OR)			

7.(a)	Draw and explain the block diagram of a negative feedback amplifier.	BTL3	3	(5M)
7.(b)	Compare the performance of a voltage-series feedback amplifier and a current-series feedback amplifier in terms of gain stability and bandwidth.	BTL4	3	(5M)
	UNIT-IV			
8.(a)	Draw and explain the circuit diagram of a phase shift oscillator using FET. Derive the condition for oscillation.	BTL3	4	(5M)
8.(b)	Calculate the frequency of a Colpitt's oscillator using a BJT. Given: C1 = 220 pF, C2 = 470 pF, and L = 10 μH. Also, determine the feedback fraction.	BTL4	4	(5M)
	(OR)			
9.	With the help of circuit diagrams, analyze the operation of Hartley and Colpitt's oscillators using BJTs. Compare their frequency equations and conditions for oscillation.	BTL4	4	(10M)
	UNIT-V			
10.	With neat diagrams, analyze the working and characteristics of a complementary symmetry Class B push-pull amplifier. Include efficiency and crossover distortion in your discussion.	BTL4	5	(10M)
	(OR)			
11(a)	Explain the working of a Class B push-pull amplifier with waveforms?	BTL4	5	(5M)
11(b)	Draw and explain single tuned capacitor coupled amplifier	BTL3	5	(5M)

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Course Code: 23EC4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Regular/Supplementary Examinations (BR23), April-2026
ANALOG COMMUNICATIONS (ECE)

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Draw the block diagram of analog communication system.	BL2	1	(2M)
b)	What is Amplitude modulation? Define modulation index of an AM	BL1	1	(2M)
c)	Plot the DSB-SC wave with a square-wave modulating signal.	BL3	2	(2M)
d)	Compare AM with DSB-SC and SSB-SC.	BL2	2	(2M)
e)	Differentiate between phase and frequency modulation.	BL2	3	(2M)
f)	What is the bandwidth required for an FM wave in which the modulating frequency signal is 2 KHz and the maximum frequency deviation is 12 KHz?	BL3	3	(2M)
g)	Define the following terms: i) Sensitivity ii) Selectivity	BL1	4	(2M)
h)	Write about the limiter used in FM receiver.	BL2	4	(2M)
i)	Define PAM,PWM and PPM.	BL3	5	(2M)
j)	What is the need for synchronization in TDM system?	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	What is single tone modulation and derive an expression for single tone amplitude modulated signal?	BL2	1	(5M)
2.(b)	With the help of waveforms and spectrum, describe the concept of Amplitude modulation both in time domain and frequency domain.	BL3	1	(5M)
	(OR)			
3.(a)	Explain how an AM wave is generated using switching modulator.	BL3	1	(5M)
3.(b)	A modulating signal of 2 cos5000t is amplitude modulated over a carrier signal of 5cos20000t. Find the modulation index, LSB and USB frequencies, and bandwidth.	BL3	1	(5M)

	UNIT-II			
4.(a)	Explain how a DSB-SC signal is detected using a coherent detector.	BL2	2	(5M)
4.(b)	Draw the block diagram for the generation and demodulation of a VSB signal and explain the principle of operation.	BL2	2	(5M)
	(OR)			
5.	Obtain a relationship between carrier and side band powers in an SSBSC wave and explain how power distribution takes place in SSB SC system.	BL3	2	(10M)
	UNIT-III			
6.	Compare AM and FM.	BL3	3	(10M)
	(OR)			
7.	Explain the principle of Angle Modulation. Derive and explain phase deviation, Modulation index, frequency deviation and percent modulation.	BL3	3	(10M)
	UNIT-IV			
8.	Describe the operation of frequency stability of FM transmitter.	BL2	4	(10M)
	(OR)			
9.	Explain the operation of super heterodyne receiver with neat block diagram.	BL2	4	(10M)
	UNIT-V			
10.(a)	With neat sketch explain the significance of Pre-emphasis and De-emphasis.	BL2	5	(5M)
10.(b)	Explain the generation of PPM, with a neat circuit diagram and wave forms	BL3	5	(5M)
	(OR)			
11.(a)	Derive the expression for FOM for DSBSC.	BL2	5	(5M)
11.(b)	With suitable block diagram and waveforms explain the four channel time division multiplexing system?	BL3	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary End Examinations (BR23), APRIL-2026

PROBABITY AND STATASTICS (CSE, AIML, CSE-AIML,IT)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1.a)	Find (i) Median (ii)Mode of the following data 5,6,2,4,7,8,3,5,6,6.	BTL2	1	(2M)
b)	Compute the coefficient of variation, if the standard deviation of marks obtained by 10 students in a class test in Mathematics is 10 and Mean is 79.	BTL2	1	(2M)
c)	Define Random Variables. Write types random variables.	BTL1	2	(2M)
d)	If X is binomially distributed random variable with mean 2 and variance 4/3, find the value of 'n'.	BTL2	2	(2M)
e)	State Central limit theorem.	BTL1	3	(2M)
f)	Explain about point and interval estimations.	BTL2	3	(2M)
g)	Briefly explain about Type 1 and Type 2 Errors	BTL1	4	(2M)
h)	Write formula for χ^2test goodness of fit and F-test.	BTL1	4	(2M)
i)	Find the value of Correlation Coefficient for the Regression Lines 3x+12y=19 and 3y+9x=46	BTL2	5	(2M)
j)	Write the normal equations of the curve y = ax + b using the method of least squares.	BTL1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Find Mean, Mode, Median, Variance and Standard deviation of the following data.	BTL2	1	(10M)

C.I	10-25	25-40	40-55	55-70	70-85	85- 100
Frequency	2	3	7	6	6	6

(OR)

3.(a)	Explain Population and Sample with suitable example.	BTL3	1	(5M)
3.(b)	Write short notes on Measures of Variability.	BTL2	1	(5M)

UNIT-II

4.(a)	A continuous variate X follows the probability law $f(x)=\begin{cases} kx^2, 0 \le x \le 10 \\ 0, \quad elsewhere \end{cases}$ Determine i) k. ii) Mean.	BTL2	2	(5M)
4.(b)	If X is a Poisson variate such that 3P(X = 4) = ½ P(X = 2) + P (X = 0), find the mean of X .	BTL2	2	(5M)

5.(a)	In a bolt factory machines A, B, C manufacture 20%, 30% and 50% of the total their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from (i) Machine A (ii) Machine B (iii) Machine C	BTL2	2	(10M)

UNIT-III

6.(a)	A population consists of five numbers **2,3,6,8, and 11**. Consider all possible samples of size two which can be drawn with replacement from this population. Find (i) The mean of the population. (ii) The standard deviation of the population. (iii) The mean of the sampling distribution of means. (iv) The standard deviation of sampling distribution of means.	BTL3	3	(10M)

(OR)

7.(a)	Define standard error. When a sample is taken from an infinite population, what happens to the standard error of the mean if the sample size is decreased from 800 and 200.	BTL3	3	(5M)
7.(b)	A random sample of size 100 has a standard deviation of 5. What can you say about the maximum error with 95% confidence?	BTL4	3	(5M)

UNIT-IV

8.(a)	Write a short note on the test of hypothesis.	BTL3	4	(5M)
8.(b)	Pumpkins were grown under two experimental conditions. Two random samples of 11 and 9 pumpkins show the sample standard deviations of their weights as 0.8 and 0.5 respectively. Assuming that the weight distributions are normal, test hypothesis that the true variances are equal.	BTL3	4	(5M)

(OR)

9.(a)	Two horses A and B were tested according to the time (in seconds) to run on a particular track with the following results: Horse A: 28 30 32 33 33 29 34 Horse B: 29 30 30 24 27 29 - Test whether the two horses have the same running capacity. Use 0.05 LOS	BTL4	4	(10M)

UNIT-V

10(a)	Find the Karl Pearson's coefficient of correlation from the following data	BTL3	5	(10M)

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

(OR)

11(a)	Fit a second degree polynomial (parabola) for the following data using least square method.	BTL3	5	(5M)

x	1	2	3	4	5	6
y	6	4	3	5	4	2

11(b)	Write normal equations for multiple linear regression	BTL2	5	(5M)

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Course Code: **23CS4T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025
OPERATING SYSTEMS
(Common to CSE,IT,CSE(AI&DS))

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is the purpose of an Operating System? Give two examples of popular operating systems.	1	1	(2M)
b)	Briefly describe the role of system calls in an operating system.	1	1	(2M)
c)	Explain the concept of process scheduling and its importance.	2	2	(2M)
d)	How does a Process Control Block (PCB) contribute to process management?	2	2	(2M)
e)	Describe the deference between preemptive kernel and non preemptive kernel?	3	3	(2M)
f)	List the different process synchronization tools	3	3	(2M)
g)	What is the main idea behind virtual memory?	1	4	(2M)
h)	Explain the memory management unit	2	4	(2M)
i)	What is the mount point in the file system mounting	2	5	(2M)
j)	Brief the access matrix in file system	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Discuss the key differences between batch processing, time-sharing, and real-time operating systems.	3	1	(10M)
	(OR)			
3.(a)	Explain the concept of operating system services.	2	1	(5M)
3.(b)	Describe the process of designing and implementing an operating system.	2	1	(5M)
	UNIT-II			
4.(a)	Compare and contrast the Shortest Job First (SJF) and FCFS scheduling algorithms.	4	2	(5M)
4.(b)	Discuss the challenges of multi-threading and how they can be addressed.	1	2	(5M)

	(OR)			
5.	Explain the different types of inter-process communication (IPC) mechanisms, including pipes, message queues, and shared memory.	3	2	(10M)
	UNIT-III			
6.	Describe the critical section problem and explain how semaphores can be used to solve it. Illustrate with a simple example.	2	3	(10M)
	(OR)			
7.(a)	Explain the concept of deadlock and describe the four necessary conditions for its occurrence.	2	3	(5M)
7.(b)	Discuss the techniques for deadlock prevention and avoidance.	2	3	(5M)
	UNIT-IV			
8.(a)	Demonstrate the advantages and disadvantages of contiguous memory allocation.	3	4	(5M)
8.(b)	Illustrate the concept of copy-on-write and its application in virtual memory management.	3	4	(5M)
	(OR)			
9.	Compare the different page replacement algorithms and their effectiveness in handling thrashing.	4	4	(10M)
	UNIT-V			
10.	Explain the concepts of file access methods and directory structure and compare various file allocation methods with their advantages and disadvantages.	4	5	(10M)
	(OR)			
11(a)	Explain the concept of protection in a file system. Discuss the principles of protection and the role of access control lists.	2	5	(5M)
11(b)	Describe the process of file-system mounting	2	5	(5M)

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Course Code: 23CS4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Regular/Supply Examinations (BR23), April-2026
DATABASE MANAGEMENT SYSTEMS [CSE, IT, AIML, CSE-(AIML)]

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Database Management System.	BTL 1	1	(2M)
b)	List different types of constraints in ER model.	BTL 1	1	(2M)
c)	Explain integrity constraints.	BTL 2	2	(2M)
d)	Describe different types of keys.	BTL 2	2	(2M)
e)	Explain CREATE TABLE command.	BTL 2	3	(2M)
f)	Define nested queries.	BTL 1	3	(2M)
g)	Explain functional dependency.	BTL 2	4	(2M)
h)	Define multivalued dependency.	BTL 1	4	(2M)
i)	Explain transaction states.	BTL 2	5	(2M)
j)	Define indexing.	BTL 1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain the characteristics and advantages of database systems.	BTL2	1	(5M)
2.(b)	Explain three-schema architecture and data independence.	BTL 2	1	(5M)
	(OR)			
3.(a)	Design an ER diagram for a university database.	BTL 3	1	(5M)
3.(b)	Explain centralized and client-server database architecture.	BT L2	1	(5M)

UNIT-II

4.(a)	Explain relational model concepts with examples.	BTL2	2	(5M)
4.(b)	Illustrate selection, projection and join operations.	BTL3	2	(5M)
	(OR)			
5.(a)	Apply relational algebra operations to retrieve information from relations.	BTL3	2	(10M)

UNIT-III

6.(a)	Compare views and tables in SQL.	BTL4	3	(10M)
	(OR)			
7.(a)	Explain the concept of "JOINs" in SQL. Provide examples for INNER JOIN, LEFT JOIN, andRIGHT JOIN	BTL 3	3	(10M)

UNIT-IV

8.(a)	Analyze functional dependencies with examples.	BTL4	4	(10M)
	(OR)			
9.(a)	Compare 1NF, 2NF and 3NF.Design normalized tables for a given database schema.	BTL 3	4	(10M)

UNIT-V

10.(a)	Explain transaction management in DBMS.	BTL 2	5	(5M)
10.(b)	Explain concurrency control protocols.	BTL 2	5	(5M)
	(OR)			
11.(a)	Evaluate different deadlock handling techniques.	BTL 5	5	(5M)
11.(b)	Analyze failure recovery mechanisms.	BTL 4	5	(5M)

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(AUTONOMOUS)

II-B.Tech II-Semester Regular/Supply Examinations (BR23), April-2026

Software Engineering [CSE, IT& CSE(AI&DS)]

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Software Development Life Cycle (SDLC).	L1	1	(2M)
b)	What is Spiral model?	L2	1	(2M)
c)	What are project management complexities?	L2	2	(2M)
d)	What is Software Requirements Specification (SRS)?	L2	2	(2M)
e)	What is cohesion? List its types.	L2	3	(2M)
f)	Define component-level design.	L1	3	(2M)
g)	What is white-box testing?	L2	4	(2M)
h)	What is software reliability?	L2	4	(2M)
i)	What is the role of CASE tools in SDLC?	L2	5	(2M)
j)	What are reuse components?	L2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Describe the exploratory style of software development.	L3	1	(5M)
2.(b)	Explain the Spiral model with its advantages.	L3	1	(5M)
	(OR)			
3.(a)	Discuss modern software development practices.	L2	1	(5M)
3.(b)	Explain modern software development trends.	L3	1	(5M)

UNIT-II

4.(a)	Describe project estimation techniques.	L3	2	(5M)
4.(b)	Explain different types of formal specifications.	L3	2	(5M)
	(OR)			
5.(a)	Explain requirement analysis and SRS in detail.	L3	2	(10M)

UNIT-III

6.(a)	Explain the software design process in detail.	L3	3	(10M)
	(OR)			
7.(a)	Discuss design principles and concepts in detail.	L2	3	(10M)

UNIT-IV

8.(a)	Explain software quality assurance and standards.	L3	4	(10M)
	(OR)			
9.(a)	Explain software reliability models and quality management systems.	L3	4	(10M)

UNIT-V

10.(a)	Describe different categories of CASE tools.	L3	5	(5M)
10.(b)	Describe reuse components and their types.	L3	5	(5M)
	(OR)			
11.(a)	Discuss the re-engineering process.	L2	5	(5M)
11.(b)	Write short notes on reuse approach.	L2	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS)
II-B.Tech II-Semester Regular Examinations (BR23), April - 2025
STATISTICAL METHODS FOR DATA SCIENCE
CSE(AI &DS)

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

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	Explain different types of maps.	(2M)	CO1	BL1
b)	What are continuous distributions?	(2M)	CO1	BL2
c)	What are the advantages of parametric estimation?	(2M)	CO2	BL2
d)	What is T-testing?	(2M)	CO2	BL1
e)	What is multiple regression?	(2M)	CO3	BL2
f)	Define variable selection?	(2M)	CO3	BL2
g)	What is link relative method?	(2M)	CO4	BL2
h)	Define growth curves?	(2M)	CO4	BL1
i)	What is B+ tree?	(2M)	CO5	BL1
j)	What are the advantages of logistic regression.	(2M)	CO5	BL2

PART–B (5X10 = 50M)

2a.	What is the difference between discrete and continuous data distributions?	5(M)	CO1	BL2
b.	What is the role of charts in statistical analysis, and how do they enhance data interpretation?	5(M)	CO1	BL3
	(OR)			
3a.	Define mean, median, and mode. How do they differ, and when would you use each measure?	5(M)	CO1	BL3
b.	Write and explain principal component analysis with real time example?	5(M)	CO1	BL3
4a.	What is the purpose of maximum likelihood estimation in parametric estimation?	5(M)	CO2	BL4
b.	What is hypothesis testing, and why is it important in statistical analysis?	5(M)	CO2	BL3
	(OR)			
5.a	What is pairwise comparison in hypothesis testing, and why is it important?	5(M)	CO2	BL4
b.	Write and explain applications of hypothesis testing.	5(M)	CO2	BL3
6a.	How does exponential regression differ from linear regression?	5(M)	CO3	BL3
b.	What does the power model $y=ax^b$ represent in terms of the relationship between variables?	5(M)	CO3	BL3
	(OR)			
7a.	How do you test the significance of the entire regression model using the F-test?	5(M)	CO3	BL3
b.	What steps are involved in fitting a curvilinear regression model to data?	5(M)	CO3	BL3

b.	Differentiate between linear growth and exponential growth in time series data.	5(M)	CO4	BL5
	(OR)			
9a.	Why is the method of least squares used to fit trends to time series data?	5(M)	CO4	BL3
b	How is the seasonal index obtained from the ratio to moving average method?	5(M)	CO4	BL3
10a	What is binary classification? How does logistic regression perform it?	5(M)	CO5	BL4
b	What metrics are commonly used to evaluate logistic regression models?	5(M)	CO5	BL3
	(OR)			
11a	What are the advantages of B+ Trees over binary search trees for database indexing?	5(M)	CO5	BL3
b	Give an example of a simple hash function and demonstrate how it indexes keys.	5(M)	CO5	BL3

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Course Code: 23AD4T01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Regular/Supply Examinations (BR23), April-2026
INTRODUCTION TO DATASCIENCE (CAD)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1.a)	What are the different facets of data in data science?	BL2	1	(2M)
b)	Name two real-life applications of data science.	BL2	1	(2M)
c)	Explain the role of machine learning in a data science project.	BL3	2	(2M)
d)	Why is data indexing important when working with large datasets?	BL2	2	(2M)
e)	What is the Hadoop framework used for?	BL2	3	(2M)
f)	What is the CAP theorem?	BL2	3	(2M)
g)	What is Neo4j?	BL3	4	(2M)
h)	Identify two applications of graph databases.	BL2	4	(2M)
i)	Explain how Crossfilter enables real-time exploration of multidimensional data.	BL2	5	(2M)
j)	List common data visualization options in JavaScript.	BL2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	What is exploratory data analysis (EDA)? Mention two objectives of performing EDA.	BL1	1	(5M)
2.(b)	How does data engineering fit into the data science ecosystem? Discuss the role of data engineers in ensuring data quality, pipeline development, and integration for analysis.	BL1	1	(5M)

(OR)

3.(a)	Explain the different phases of the data science process.	BL2	1	(5M)
3.(b)	What are the expected outcomes of data transformation in a DS project?	BL1	1	(5M)

UNIT-II

4.(a)	Describe how Python's scikit-learn library is used in data science.	BL2	2	(5M)
4.(b)	Describe the challenges in selecting the right model for a dataset.	BL2	2	(5M)
	(OR)			
5.(a)	Explain the purpose of validation in the model development cycle.	BL2	2	(5M)
5.(b)	Describe how `Pipeline` in sklearn simplifies the ML workflow.	BL2	2	(5M)

UNIT-III

6.(a)	Explain how Hadoop enables distributed data storage	BL2	3	(10M)
	(OR)			
7.(a)	Explain in detail about the various types of NoSQL DataBases and write advantages of NoSQL DataBases.	BL2	3	(10M)

UNIT-IV

8.(a)	Describe the role of Python librarics in text mining.	BL2	4	(5M)
8.(b)	Apply Neo4j to model relationships in a social media network	BL3	4	(5M)
	(OR)			
9.(a)	Discuss how graph databascs differ from relational databases.	BL3	4	(5M)
9.(b)	Use nltk to perform sentiment analysis on Reddit posts.	BL3	4	(5M)

UNIT-V

10.(a)	Build an interactive dashboard using dc.js for sales analysis.	BL3	5	(5M)
10.(b)	Discuss the benefits of using MapReduce for large-scale data processing.	BL3	5	(5M)
	(OR)			
11.(a)	Apply the MapReduce concept to analyze large web logs.	BL3	5	(5M)
11.(b)	Discuss how JavaScript enhances the functionality of data visualizations.	BL3	5	(5M)

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Course Code: : **23AM4T01**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II-B.Tech II-Semester Regular/Supply End Examinations (BR23), April-2026
MACHINE LEARNING [AI&ML, CSE (AI&ML)]

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Explain the difference between rote learning and learning by induction in the context of machine learning	L2	1	(2M)
b)	Describe the importance of model evaluation in machine learning.	L2	1	(2M)
c)	Differentiate between KNN classifier and KNN regression	L2	2	(2M)
d)	Explain the term 'non-metric similarity functions'	L2	2	(2M)
e)	Explain the purpose of the bias–variance trade-off in tree-based models	L2	3	(2M)
f)	What do you understand by regression using decision trees?	L1	3	(2M)
g)	Define the perceptron learning algorithm?	L2	4	(2M)
h)	Differentiate between logistic regression and linear regression?	L2	4	(2M)
i)	Explain the concept of clustering in machine learning	L2	5	(2M)
j)	What is matrix factorization in the context of clustering?	L1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain the stages involved in a typical Machine Learning process	L2	1	(10M)
	(OR)			
3.(a)	Describe the steps involved in data acquisition and why it is critical to machine learning success	L2	1	(5M)
3.(b)	What are the different types of data in machine learning? Provide examples.	L2	1	(5M)

UNIT-II

4.(a)	Discuss the types of proximity measures used in classification and regression tasks	L2	2	(5M)
4.(b)	Summarize the key differences between evaluating classification models and regression models	L2	2	(5M)
	(OR)			
5.(a)	Describe the K-Nearest Neighbor (KNN) algorithm with an example	L3	2	(10M)

UNIT-III

6.(a)	Explain how random forests improve classification and regression tasks compared to Decision Tree.	L2	3	(10M)
	(OR)			
7.(a)	Explain how decision trees perform regression and give an example.	L2	3	(5M)
7.(b)	Explain how random forests reduce overfitting compared to single decision trees	L2	3	(5M)

UNIT-IV

8.(a)	Explain the backpropagation algorithm used in training an MLP?	L2	4	(5M)
8.(b)	Explain the concept of linear discriminants in classification?	L2	4	(5M)
	(OR)			
9.(a)	Explain logistic regression and its application in classification.	L2	4	(10M)

UNIT-V

10(a)	Explain K-means clustering with its applications?	L2	5	(10M)
	(OR)			
11(a)	What is spectral clustering? Explain its process and applications.	L2	5	(5M)
11(b)	Illustrate the steps involved in expectation maximization-based clustering?	L3	5	(5M)

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Course Code: 23AM4T02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU (AUTONOMOUS)

II B.Tech-II Semester Regular/Supply Examinations (BR23), APRIL-2026

DIGITAL LOGIC & COMPUTER ORGANIZATION [AI&ML, CSE(AI&ML)]

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Convert the hexadecimal number $(3B.C)_{16}$ into its decimal equivalent.	1	1	(2M)
b)	What is a multiplexer? Mention the different types of multiplexers.	1	1	(2M)
c)	Define a sequential circuit. How does it differ from a combinational circuit?	2	2	(2M)
d)	Define synchronous and asynchronous counters with an example.	2	2	(2M)
e)	Why are fast adders necessary in digital circuits?	3	3	(2M)
f)	List the advantages of Booth's multiplication algorithm.	3	3	(2M)
g)	Compare SRAM and DRAM.	2	4	(2M)
h)	How is cache memory different from main memory?	2	4	(2M)
i)	Explain the role of buses in I/O systems.	2	5	(2M)
j)	What is the purpose of interface circuits in computer systems?	1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain fixed-point and floating-point number representations with suitable examples.	2	1	(10M)

(OR)

3.(a)	Design a 4-to-1 multiplexer. Explain its working with a truth table and logic diagram.	3	1	(5M)
3.(b)	Explain the implementation of a full adder using two Half Adders.	3	1	(5M)

UNIT-II

4.(a)	What is a sequential circuit? Describe various types of sequential circuits.	2	2	(5M)
4.(b)	Define a register. Explain different types of registers used in digital systems.	2	2	(5M)

(OR)

5.(a)	Analyze the Von Neumann architecture with a neat block diagram and explain its components.	4	2	(10M)

UNIT-III

6.(a)	Perform addition and subtraction of signed numbers using 1's and 2's complement methods with examples.	3	3	(10M)

(OR)

7.a)	Compare hardwired and microprogrammed control units using block diagrams.	3	3	(5M)
7.b)	Discuss the advantages and disadvantages of hardwired versus microprogrammed control units.	3	3	(5M)

UNIT-IV

8.a)	Explain different types of Read-Only Memories (ROMs) and their applications.	2	4	(10M)

(OR)

9.a)	Analyze cache memory and explain different cache mapping techniques with suitable diagrams.	4	4	(10M)

UNIT-V

10.a)	Analyze DMA operation. Draw the block diagram of a DMA controller and explain its key components and operating modes.	4	5	(10M)

(OR)

11.a)	Describe various types of interrupts in computer systems with examples.	2	5	(10M)

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Course Code: 23HM4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2026

Optimization Techniques (IT, CSE(AI&DS), AI&ML & CSE(AI&ML))

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

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Explain about design vector and design constraints of an optimization problem.	1	1	(2M)
b)	Explain the significance of constraint surface in optimization problem.	1	1	(2M)
c)	Define Slack and Surplus in Linear Programming Problem.	1	2	(2M)
d)	Define standard form of Linear Programming problem.	1	2	(2M)
e)	Explain least cost method in transportation problem.	2	3	(2M)
f)	Explain how unbalanced transportation problems can be handled.	1	3	(2M)
g)	Explain about interior penalty function method.	2	4	(2M)
h)	Explain basic principle of steepest descent method.	1	4	(2M)
i)	Explain the concept of dynamic programming in the context of decision-making processes.	2	5	(2M)
j)	Explain principle of optimality in dynamic programming.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Find the maxima, minima and points of inflection for the given function . $f(x) = 12x^5 - 45x^4 + 40x^3 + 5$	3	1	(10M)
	(OR)			
3.(a)	State and explain Kuhn-Tucker conditions applicable to non-linear programmingproblem.	2	1	(5M)
3.(b)	Explain the concept of Multivariable optimization with equality constraints and write their necessary and sufficient conditions for minima and maxima.	2	1	(5M)
	UNIT-II			
4.(a)	MaximizethefunctionZ=6x+5y *Subject to* 2x-3y≤5, x+3y≤11, 4x+y≤15 and x,y≥0 using graphical method	3	2	(5M)

Problem

(OR)

5. Solve the following Linear programming problem by Simplex method. 3 2 (10M)
Minimize $z = x_1 - 2x_2 + x_3$
Subject to: $x_1 + 2x_2 - 2x_3 \le 4$; $x_1 - x_3 \le 3$; $2x_1 - x_2 + 2x_3 \le 2$
$x_1, x_2, x_3 \ge 0$

UNIT-III

6. Determine the basic feasible solution for the transportation matrix given below using Vogel approximation method, and determine its optimal cost. 3 3 (10M)

Plants \ Destinations	1	2	3	4	Supply
1	2	3	11	7	6
2	1	0	6	1	1
3	5	8	15	9	10
Demand	7	5	3	2	

(OR)

7. Determine the basic feasible solution of the following transportation problem by North-West corner rule. Also fine the optimal transportation plan. 3 3 (10M)

	1	2	3	4	5	Available
A	4	3	1	2	6	80
B	5	2	3	4	5	60
C	3	5	6	3	2	40
D	2	4	4	5	3	20
Required	60	60	30	40	10	

UNIT-IV

8.(a) Explain the Univariate method in the context of one-dimensional minimization 2 4 (5M)

8.(b) Explain the procedure of Fibonacci search method for minimization of non-linear programming problems 2 4 (5M)

(OR)

9. Minimize the given function with the starting point (0,0) using Univariate method 3 4 (10M)

$$f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$$

UNIT-V

10(a) State Bellman's principle of optimality and explain by an illustrative example how it can be used to solve multistage decision problem. 2 5 (5M)

10(b) Explain the typical applications and limitations of Dynamic programming. 2 5 (5M)

(OR)

11(a) Explain the computational procedure in Dynamic programming? 2 5 (5M)

11(b) Explain the concept of Sub-optimization and principle of optimality with an example. 2 5 (5M)

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(AUTONOMOUS)

II-B. Tech II-Semester Supplementary Examinations (BR20), April - 2026

NUMERICAL METHODS AND COMPLEX VARIABLES

(CE,EEE,ME,ECE,CSE,CSE(AI&DS),AIML, CSE(AI&ML),)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Find a real root of the equation $e^x \sin x = 1$ by using by Newton's-Raphson method (7M)

1.b) Find a real root of the equation $x^3-4x-3=0$ by using by a Bisection method. (7M)

(OR)

1.c) Find the positive root of the equation $3x = \cos x + 1$ by using the iteration method (7M)

1.d) Evaluate $\sqrt{28}$ to four decimal places by Regula-False Method. (7M)

UNIT-II

2.a) Find f (2.5) using Newton's forward formula for the following table (7M)

X	0	1	2	3	4	5	6
Y	0	1	16	81	256	625	1296

2.b) Find f (3.5) using Gauss's forward formula for the following table (7M)

X	0	1	2	3	4	5	6
Y	0	1	16	81	256	625	1296

(OR)

2.c) Evaluate $\int_0^2 e^{-x^2} dx$ using (i) Simpson's $\frac{3}{8}^{th}$ rule (ii) Simpson's $\frac{1}{3}^{rd}$ rule taking h=0.25 (14M)

UNIT-III

3.a) Solve $y^1 = x - y^2$, y(0)=1 Using Taylor's series method and find y(0.1), y(0.2) (7M)

3.b) Using Modified Euler's method, Solve the $y' = -xy^2, y(0) = 2$ find y (0.2), where h=0.1 (7M)

(OR)

3.c) Using Runge-Kutta 4th order method, Solve the $y' = \frac{x+y}{x}, y(1) = 1$ find y (2), where h=0.5 (14M)

UNIT-IV

4.a) Prove that $\beta(m,n) = \frac{\Gamma m \Gamma n}{\Gamma(m+n)}$ where $m > 0, n > 0$ (7M)

4.b) Show that $\int_0^\infty \sqrt{x} e^{-x^3} dx = \frac{\sqrt{\pi}}{3}$ (7M)

(OR)

4.d) Show that $\int_0^{\pi/2} \sin^2\theta \cos^4\theta = \Pi/32$ (7M)

UNIT-V

5.a) Prove that the function f(z) defined by $f(z) = \frac{x^3(i+1)-y^3(1-i)}{x^2+y^2}$ $(z \neq 0)$, $f(0) = 0$ is continuous and the Cauchy-Riemann equations are satisfied at the origin. (7M)

5.b) Show that the function $u = 2\log(x^2 + y^2)$ is harmonic and hence find its harmonic conjugate function. (7M)

(OR)

5.c) Evaluate $\int_c (y^2 + 2xy)dx + (x^2 - 2xy)dy$ where c is the boundary of the region by $y = x^2$ and $x = y^2$. (7M)

5.d) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the region $1<|z|<2$. (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Supplementary Examinations (BR20), April-2026
ADVANCED SOLID MECHANICS (Civil)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Develop the relation between torque and polar moment of inertia. (7M)

1.b) Find the diameter of a solid shaft which will transit 300kW at 250 r.p.m. The maximum shear stress should not exceed 30 N/mm^2 and twist should not be more than 10 in a shaft length of 2 m, Take C=1×105 N/mm^2. (7M)

(OR)

1.c) Differentiate close coiled and open coiled helical springs. (7M)

1.d) Calculate the diameter of a closely coiled helical spring to carry 500 N load, its mean coil diameter is 10 times that of wire. Assume maximum shear stress in the spring material as 80N/mm^2. (7M)

UNIT-II

2.a) Derive an expression for the Euler's crippling load for a long column with both ends is fixed. (7M)

2.b) Find the crippling load using Euler's formula for a column having a T section with a flange 120 mm x 16 mm and web 150 mm x16mm is 3m long. Assuming the column to be hinged at both ends and E = 2 x 10^6 Kg/cm^2 (7M)

(OR)

2.c) Explain how Rankine-gordon formula is used to calculate the intensity of stresses in short and long columns. (7M)

2.d) Calculate the safe compressive load on a hollow cast iron (one end fixed and other end hinged) of 10cm external diameter ,7cm internal diameter and 8 m length. Use Euler's formula with factor safety 4 and E=95kN/mm^2. (7M)

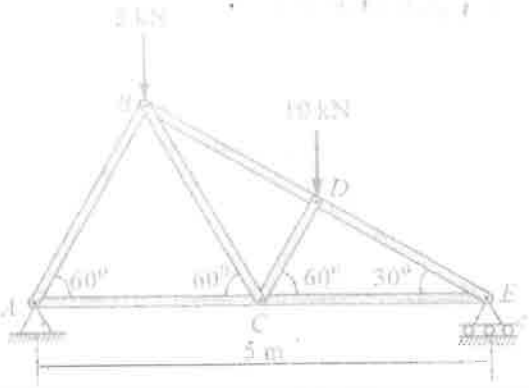
UNIT-III

3.a) Sketche the kernel of the following cross sections (7M)
Rectangle 200mm×300 mm
Hollow rectangular cylinder with external diameter=300mm,thickness=50mm
Square with 400 cm^2 area

3.b) Estimate the maximum and minimum stress in the section of a hollow rectangular column of external depth 1 m and external width 1 m is 10 cm thick., if vertical load of 200 kN is acting with an eccentricity of 20 cm. (7M)

(OR)

3.c) Determine the forces in all the members of the frame by method of joints (14M)



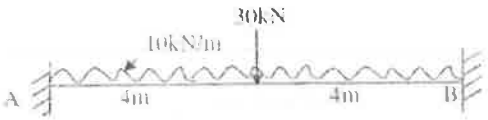
UNIT-IV

4.a) Calculate the prop reaction and draw the shear force and bending moment diagrams for a propped cantilever of span 9.2m is fixed at one end and propped at the other end and carries a UDL of 12.7kN/m on its whole span. (7M)

4.b) Draw the BMD for propped cantilever with prop at free end carrying a point load at centre. (7M)

(OR)

4.c) Draw the BM and SF Diagrams for a fixed beam shown in Figure. (7M)



4.d) Find the moment at the left hand support, if a fixed beam of span 'L' is sunk by an amount 'Δ' at the right hand support. (7M)

UNIT-V

5.a) Calculate the moments by slope Claperon's theorem in a continuous beam ABC with constant EI throughout its length. The end supports A and C are fixed and beam is continuous over middle support B. Span BC is uniformly loaded with 10kN per metre length, while a concentrated vertical load of 100kN acts at the mid span AB. (14M)

(OR)

5.b) Find the following for a continuous beam ABC consists of two spans AB of length 4m, and BC of length 3m.The span AB carries a point load of 100 KN at its middle points. The span BC carries a point load of 120 KN at 1m from C. The end A is fixed and the end C is simply supported. Use Clapeyron's theorem of three moments. (14M)

i) The moments at the supports
ii) ii) The reactions at the supports and
iii) iii) Draw the B.M diagram.

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(AUTONOMOUS)

II-B.Tech II-Semester Supplementary Examinations (BR20), April-2026

ENVIRONMENTAL ENGINEERING (Civil Engineering)

Time: 3 hours Max. Marks: 70

Paper consists of five questions, each question has internal choice, and either of them can be answered. All Questions carry Equal Marks

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UNIT-I

1.a) Discuss about 'Fire Demand' with various formulae? (7M)

1.b) The census records of a town are given. Estimate the population of the town in 1980, 1990 and 2000 by using geometric growth method. (7M)

year	1940	1950	1960	1970
population	8000	12000	17000	22500

(OR)

1.c) Discuss various factors affecting the per capita demand of water. (7M)

1.d) The census records of a town are given. Estimate the population of the town in 2010 using decrease rate of growth method. (7M)

year	1940	1950	1960	1970	1980
population	25000	28000	32500	40000	45000

UNIT-II

2.a) What is disinfection? Discuss various methods of disinfection. (7M)

2.b) Write short note on a) Reverse osmosis b) Adsorption (7M)

(OR)

2.c) Derive stokes law for settling of discrete particles? (7M)

2.d) Discuss about Iron and Manganese removal in water treatment? (7M)

UNIT-III

3.a) Write short note on 'Hardy-Cross method'. (7M)

3.b) What is storm water and explain about quantification of storm water? (7M)

(OR)

3.c) Describe the advantages and disadvantages of grid iron and dead-end system of pipe network? (7M)

3.d) What are the differences between drains and sewers? What are the requirements of an ideal drain section? With the help of neat sketches, describe various drain sections. (7M)

UNIT-IV

4.a) What do you understand by the significance of B.O.D? How it is determined? (7M)

4.b) Explain the modifications in activated sludge process. (7M)

(OR)

4.c) Differentiate between aerobic and anaerobic treatment processes. (7M)

4.d) Explain briefly about the Grit chambers. (7M)

UNIT-V

5.a) Explain with neat sketch the working principle of standard rate trickling filter. (7M)

5.b) Write short notes on Sludge disposal methods. (7M)

(OR)

5.c) Write short note on a)Rotating biological contactors b) Fluidized bed reactors. (7M)

5.d) Explain in detail working and design of Imhoff tank with neat sketch. (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Supplementary Examinations (BR20), April - 2026
PYTHON PROGRAMMING (CIVIL & MECH)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain different features in python.	(7M)
1.b)	Write the basic syntax of python and explain every component of it.	(7M)
	(OR)	
1.c)	Explain different keywords in python.	(7M)
1.d)	What is indentation? Explain its importance in python with example.	(7M)

UNIT-II

2.a)	Explain different arithmetic operators in python with example.	(7M)
2.b)	Explain different comparison operators in python with example.	(7M)
	(OR)	
2.c)	Explain different membership operators.in python with example.	(7M)
2.d)	Explain standard data types and type conversion in python.	(7M)

UNIT-III

3.a)	Explain using else statement with loops with example.	(7M)
3.b)	Write a python program to generate Fibonacci series up to n using for loop.	(7M)
	(OR)	
3.c)	Write a python program to print reverse of a given number without using built in functions.	(7M)
3.d)	Explain elif statement in python with example.	(7M)

UNIT-IV

4.a)	What is tuple? Explain different methods of it with example.	(7M)
4.b)	What is exception? Explain except Clause with No Exceptions with example.	(7M)
	(OR)	
4.c)	Write a python program for reverse of a given string without using built-in functions.	(7M)
4.d)	What is exception? Explain try-finally Clause with example.	(7M)

UNIT-V

5.a)	What is argument? Explain default arguments in python with example.	(7M)
5.b)	Compare and contrast Global vs. Local variables.	(7M)
	(OR)	
5.c)	Write about OOP terminology in python.	(7M)
5.d)	Write a python program to read contents from keyboard and write it into file.	(7M)

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Course Code: 20HS4T02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Supplementary Examinations (BR20), April-2026
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Common for CE, EEE, ME, ECE and CSE

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Define Business and explain the characteristics of Business. (7M)

1.b) Explain how external factors affecting the Business Environment. (7M)

(OR)

1.c) What do you mean by company and explain the features of company (7M)

1.d) Describe the concept of start-ups. (7M)

UNIT-II

2.a) Define Managerial Economics and explain its nature. (7M)

2.b) What is demand and explain the types of demand. (7M)

(OR)

2.c) What is demand forecasting and explain the methods of demand forecasting. (14M)

UNIT-III

3.a) Define production function and explain production function with one variable input factor. (7M)

3.b) What do you understand by BEP and explain the Significance of Break Even Analysis. (7M)

(OR)

3.c) Explain various types of cost concepts in cost analysis. (7M)

3.d) From the following information calculate (7M)

(1) Break Even Point
(2) P/V Ratio
(3) Sales when profit are Rs. 5,00,000

sales	Rs. 15,00,000
Fixed Expenses	Rs. 5,00,000
Variable Expenses	Rs. 4,00,000

UNIT-IV

4.a) What is market structure and explain the classification of market structures. (7M)

4.b) Define pricing and explain various methods of pricing. (7M)

(OR)

4.c) Describe the concept of monopolistic competition. (7M)

4.d) Explain various factors effecting pricing. (7M)

UNIT-V

5.a) Define Accounting and Explain the principles of Accounting (7M)

5.b) Journalise the following transactions. (7M)

January	Transactions	Rupees
1	X started business with a capital of	1,00,000/-
2	cash deposited into bank	30,0000/-
5	Purchased furniture	25,000/-
8	Paid rent	8,000/-
15	Sold goods to Rajesh	18,000/-
18	Received commission	800/-
25	Paid wages	3,000/-

(OR)

5.c) What is capital and Explain the types of capital. (7M)

5.d) A limited is considering investment in a project requiring a capital outlay of Rs. 2, 00,000. The project annual cash inflows are as follows. (7M)

Year	1	2	3	4	5
CIF	50,000	60,000	70,000	60,000	50,000

Calculate Net Present value and Profitability Index by taking cost of capital as 10%

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Course Code: 20EE4T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
II-B. Tech II-Semester Supplementary Examinations (BR20), APRIL - 2026
ELECTRICAL MACHINES-II (EEE)

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

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*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Explain the phenomenon of rotating magnetic field in three phase induction motor. (14M)

(OR)

1.c) A 20 kW, 4 pole, 400V, 50Hz 3 phase induction motor has a full load slip of 0.02. If the torque lost in mechanical losses is 30Nm, find the rotor ohmic losses, motor input and efficiency, Stator losses are 1000 watts. (7M)

1.d) Differentiate between three phase induction motor and Transformer. (7M)

UNIT-II

2.a) Derive the expression for the starting torque of 3-phase induction motor and condition for the maximum starting torque. (7M)

2.b) What is induction generator? Discuss the principle of operation of induction generator. (7M)

(OR)

2.c) Draw the torque-slip characteristics of a 3-phase induction motor and explain briefly? (7M)

2.d) Explain No-load and blocked rotor test of a 3-phase induction motor. (7M)

UNIT-III

3.a) Describe the construction and principle of operation of shaded pole induction motor. (7M)

3.b) What are the various starting methods of single-phase induction motors and explain capacitor start and capacitor run motor? (7M)

(OR)

3.c) Discuss the double field revolving theory and explain the torque-slip characteristics of single-phase induction motor. (7M)

3.d) Draw and explain the equivalent circuit of single-phase induction motor. (7M)

UNIT-IV

4.a) With neat diagrams, explain the constructional features of non-salient pole synchronous machine. (7M)

4.b) A 100KVA, 3000V, 50Hz star connected alternator has effective armature resistance of 0.2 ohms. The field current of 40A produce short-circuit current of 200A and an open circuit emf of 1040V (line). Calculate the full load voltage regulation at 0.8 lagging and 0.8 leading power factors. Draw phasor diagrams. (7M)

(OR)

4.c) Explain briefly voltage regulation by synchronous impedance method with neat diagram. (7M)

4.d) Explain briefly parallel operation of synchronous generator with infinite bus, with neat diagrams. (7M)

UNIT-V

5.a) Derive the expression for the torque developed by the 3-phase synchronous motors. (14M)

(OR)

5.c) Draw and explain phasor diagram of 3 phase synchronous motor at different power factors. (7M)

5.d) Derive the expression for active and reactive power developed by synchronous motors. (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

II-B. Tech II-Semester Supplementary Examinations (BR20), April-2026

POWER SYSTEMS-I (EEE)

Time: 3 hours | Max. Marks: 70

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*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain briefly about the steam generating plant in thermal power plant.	(7M)
1.b)	Explain the following a) Cooling Towers. b) Electro static precipitator units.	(7M)
	(OR)	
1.c)	Compare jet condensers and surface condensers in six aspects.	(7M)
1.d)	State and explain the methods to control pollution in thermal power plant.	(7M)
	UNIT-II	
2.a)	With the help of neat layout, explain the function of each block of nuclear power plant and also write their advantages and disadvantages.	(14M)
	(OR)	
2.c)	Explain the need of coolant, reflector and control rods.	(7M)
2.d)	Explain the fusion reaction with mass-energy balance equation.	(7M)
	UNIT-III	
3.a)	Discuss the design features of distribution system	(7M)
3.b)	Derive the voltage drop equation for uniformly distributor fed at one end.	(7M)
	(OR)	
3.c)	Explain about ring main distribution system with neat diagram and also write the advantages.	(7M)
3.d)	Explain the following a) Ring main distributor b) Stepped distributor.	(7M)
	UNIT-IV	
4.a)	With the help of relevant diagram, explain about double bus-bar arrangements with two circuit breakers.	(7M)
4.b)	Discuss about main and transfer bus bar system.	(7M)
	(OR)	
4.c)	Draw and explain the layout of 33KV /11kV substation.	(7M)
4.d)	Discuss the constructional aspects of gas insulated substations.	(7M)
	UNIT-V	
5.a)	Describe the general construction of an underground cable with neat sketch.	(7M)
5.b)	Derive an expression for the stress in insulation.	(7M)
	(OR)	
5.c)	A 15 MW power station generates $50 * 10^6$ units of energy per annum. Determine its load factor. If the load is improved to 60%, calculate the energy generated by the power station.	(7M)
5.d)	The tariff in force is Rs 210 per KVA of maximum demand plus 15 paise per unit consumed. If the load factor is 65%. Find the cost per unit at 1. Unity power factor. 2. 0.8 power factor lagging.	(7M)

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Course Code: 18EE4T07

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations (BR18), April-2026
POWER SYSTEMS – I (EEE)

Time:3 hours **Max.Marks:60**

Question Paper consists of Part-A and Part-B
Answer ALL the Question in Part-A
Answer any FOUR Questions from Part-B

PART-A(6X2=12Marks)

1. a) Draw the General layout of a Thermal power plant. (2M)
   b) Mention the materials used as Control rods and Shield in a nuclear reactor (2M)
   c) What is the requirement of a Distribution system?. (2M)
   d) List out the different types of Bus bar arrangements? (2M)
   e) What do you mean by Grading of Cables and its necessity? (2M)
   f) Define the load curve (2M)

PART-B(4X12=48Marks)

2. a)Explain the working of Thermal power station with a neat layout diagram. (12M)
3. a) With the help of neat diagram, describe the working of nuclear power plant. (12M)

4. a) Explain in detail about primary and secondary Distribution system (6M)
   b)A two-conductor street main AB,500 meters in length is fed from both ends at 250 V. (6M)
   Loads of 50A,60A,40A and 30A are tapped at distance of 100m,250m,350m and 400m from A respectively. If the cross-section of the conductor be 1cm2 and specific resistance of the material of the conductors is 1.7μΩ-cm, determine the minimum consumer voltage.
5. a) Make a list of the main equipment in a gas insulated sub-station. Draw layout of a gas insulated sub- station. (6M)
   b) Draw the key diagram of a typical 11kV/ 400V indoor substation. (6M)
6. a) Explain the Two part tariff in detail. (8M)
   b)A base load station having a capacity of 400 MW and a stand by station having a capacity of 50MW shares a common load. Find the annual load factors and capacity factors of two power stations from the following data. (4M)
   Annual standby station output = 87.33 x 106 KWH
   Annual base load station output = 102 x 106 KWH
   Peak load on standby station = 120MW
   Hours of use by standby station/year = 3000hrs
7. a)Explain the following terms in connection with the Power supply system: (12M)
   i. Maximum Demand
   ii. Load Factor
   iii. Plant Use factor
   iv. Station demand Factor
   v. Effect of load factor on the cost of generation in a power system

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Course Code: 20ES4110

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II- B. Tech II-Semester Supplementary Examinations (BR20), April – 2026
ELECTROMAGNETIC FIELDS (EEE)

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

Paper consists of five questions, each question has internal choice, and either of them can be answered.
All Questions carry Equal Marks

UNIT-I

1.a)	Derive the expression for electric field intensity and potential due to an Electric dipole.	(7M)
1.b)	Explain the behaviour of a conductor placed in an electric field, including the distribution of charge, surface charge density, and the resulting electric field inside and outside the conductor.	(7M)
	(OR)	
1.c)	Calculate the capacitance of parallel plate capacitors	(7M)
1.d)	Explain the Electric field intensity (EFI)due to Continuous surface charge distributions	(7M)
	UNIT-II	
2.a)	calculate the magnetic field intensity (MFI) due to an infinite sheet of current and a long filament carrying conductor	(14M)
	(OR)	
2.c)	Derive the Maxwell's second equation	(7M)
2.d)	Write and explain the Maxwell's Third Equation	(7M)
	UNIT-III	
3.a)	Derive the expression for the force on a straight, long current-carrying conductor placed in a magnetic field.	(7M)
3.b)	Two long, parallel conductors 10 cm apart carry currents of 20 A and 30 A in the same direction. Find the force per meter length between them	(7M)
	(OR)	
3.c)	Explain the magnetic force on moving charges and current-carrying conductors. Derive the expression for force between two parallel conductors.	(14M)
	UNIT-IV	
4.a)	Determine the inductance of a Coaxial Cable?	(7M)
4.b)	Derive the Expression for energy Stored in a magnetic field	(7M)
	(OR)	
4.c)	Explain about self-inductance of solenoid and toroid?	(14M)
	UNIT-V	
5.a)	What is the modification proposed by Maxwell for time varying fields?	(7M)
5.b)	Write the point forms of Maxwell's equations	(7M)
	(OR)	
5.c)	Derive and explain Poynting's theorem and the Poynting vector. Describe how the Poynting vector represents the flow of electromagnetic energy in a field and its significance in understanding energy transfer in electromagnetic waves.	(14M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

II-B. Tech II-Semester Supplementary Examinations (BR20), APRIL - 2026

IC ENGINES & COMPRESSORS (ME)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks. The Question can be a single question carrying 14 Marks or can split into two with 7 + 7 or according to the depth of answer*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Draw and explain ideal and actual valve timing diagram for a 4-stroke CI engine.	(8M)
1.b)	What are the differences between air standard cycle and fuel-air cycle analysis?	(6M)

(OR)

1.c)	Explain the working of 2-Stroke petrol engine with suitable sketches.	(8M)
1.d)	Define volumetric efficiency and discuss the factors affecting the volumetric efficiency.	(6M)

UNIT-II

2.a)	Explain magneto Ignition system with neat sketch.	(7M)
2.b)	Explain different types of cooling systems used for IC engines. Give the disadvantages of improper cooling.	(7M)

(OR)

2.c)	What are the functional requirements of an fuel injection system.	(7M)
2.d)	Describe the difference between MPFI and CRDI.	(7M)

UNIT-III

3.a)	Explain normal and abnormal combustion with neat sketches in S.I engines?	(8M)
3.b)	Explain the factors affecting Delay period in C.I Engine.	(6M)

(OR)

3.c)	Explain about the various types of combustion chambers of S.I Engine with neat sketch.	(8M)
3.d)	Compare the knocking phenomenon between the SI and CI engines.	(6M)

UNIT-IV

4.a)	Explain the following in relation to an I.C. Engine: (i) Mean effective pressure (ii) volumetric efficiency.	(6M)
4.b)	The following results were obtained from a test on a single cylinder, four stroke diesel engine. Diameter of the cylinder is 30 cm, stroke of the piston is 45 cm, indicated mean effective pressure is 540 kPa and engine speed is 240 rpm. Find the indicated power of the engine. If the mechanical efficiency is 80%, also find the brake power, friction power and brake mean effective pressure of the engine.	(8M)

(OR)

4.c)	List various methods to determine friction power in an engine. Explain the morse test with suitable equations.	(8M)
4.d)	A 4-cylinder 4-stroke petrol engine develops 14.7 kW at 1000 rpm. The mean effective pressure is 5.5 bar. Determine the bore and stroke of the engine, if the stroke is 1.5 times the bore.	(6M)

UNIT-V

5.a) Explain with neat sketch working principle of Roots blower. (7M)

5.b) A two stage air compressor takes in air at a pressure of 1.013 bar and temperature 16^0C. The inter-cooling is perfect. The delivery pressure is 19 bar. Find the condition for minimum work of compression and also the work input required to compress 1kg of air. Take n=1.3. (7M)

(OR)

5.c) List out the differences between centrifugal and axial flow compressors. (6M)

5.d) In an axial flow compressor with degree of reaction 0.5, inlet blade angle is 45° and outlet blade angle of 14°. The velocity of flow is 146 m/s, remaining constant from inlet to outlet. The mean blade velocity is 200 m/s. Calculate the power required in kW and the pressure rise at an air flow rate of 10kg/s. (8M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations (BR20), April-2026
MANUFACTURING TECHNOLOGY (ME)

Time: 3 hours Max. Marks: 70

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*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain the investment casting process with neat sketch and its advantages.	(7M)
1.b)	Discuss the types and causes of casting defects with remedial measures.	(7M)
	(OR)	
1.c)	Explain the design considerations for gating systems in sand casting.	(7M)
1.d)	Describe the construction and working of a cupola furnace with zone-wise reactions.	(7M)

UNIT-II

2.a)	Describe the principle and operation of TIG and MIG welding processes.	(7M)
2.b)	Explain the classification of welding processes and types of welded joints.	(7M)
	(OR)	
2.c)	Describe the defects in welded joints and their causes.	(7M)
2.d)	Discuss the working of oxy-acetylene gas welding and types of flames.	(7M)

UNIT-III

3.a)	Explain the hot and cold working processes with examples.	(7M)
3.b)	Discuss the extrusion process and mention its types and applications.	(7M)
	(OR)	
3.c)	Describe the forging operations, equipment, and defects.	(7M)
3.d)	Explain wire drawing and tube drawing processes with advantages and limitations.	(7M)

UNIT-IV

4.a)	Explain orthogonal cutting and Merchant's force diagram.	(7M)
4.b)	Describe the types of chips and tool wear mechanisms.	(7M)
	(OR)	
4.c)	Explain the working and tool layout of turret and capstan lathes.	(7M)
4.d)	Write about he specifications and operations performed on an engine lathe.	(7M)

UNIT-V

5.a)	Describe various milling operations and indexing methods.	(7M)
5.b)	Explain grinding wheel selection and classification of grinding machines.	(7M)
	(OR)	
5.c)	Discuss drilling machine types and operations.	(7M)
5.d)	Differentiate between honing, lapping, and broaching processes.	(7M)

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Course Code: 20EC4T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B.Tech. II-Semester Supplementary Examinations (BR20), April -2026
ELECTRONIC CIRCUITS -II (ECE)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Compare the three types of coupling methods used in multistage amplifiers.	(7M)
1.b)	Draw the circuit for Cascode Amplifier. Explain its working, obtain overall values of the circuit in terms of h-parameters.	(7M)

(OR)

1.c)	Classify the amplifiers.	(7M)
1.d)	Draw the circuit diagram, equivalent circuit of a Darlington pair and derive expressions for overall voltage gain and input impedance.	(7M)

UNIT-II

2.a)	Draw the circuit of a voltage series feedback amplifier and derive the expressions for Rif and Rof.	(7M)
2.b)	The open loop gain of an amplifier is 100. What will be the overall gain when a negative feedback of 0.5 is applied to the amplifier?	(7M)

(OR)

2.c)	Draw block diagram of a general feedback amplifier. State the function of each block	(7M)
2.d)	Show that bandwidth increases in negative feedback amplifiers	(7M)

UNIT-III

3.a)	Derive the expression frequency of oscillation and condition for sustained oscillations of a BJT based RC Phase shift oscillator.	(7M)
3.b)	In a Hartely oscillator L2=0.04mH and C=0.004μF. If the frequency of oscillations is 150KHz, find L1. Neglect mutual inductance	(7M)

(OR)

3.c)	Derive the frequency of oscillation of Hartley oscillator.	(7M)
3.d)	Draw the equivalent of a crystal and Explain Miller Crystal Oscillator.	(7M)

UNIT-IV

4.a)	Draw the Series fed Class-A Power Amplifier and explain operation in detail with necessary equations. Also derive the expression for maximum conversion efficiency.	(7M)
4.b)	Explain the heat sinks and distortions in amplifiers.	(7M)

(OR)

4.c)	Draw the circuit diagram of class AB PushPull amplifier and explain its working.	(7M)
4.d)	Draw and explain double tuned amplifier.	(7M)

UNIT-V

5.a)	With Collector catching Diodes draw and Explain Bistable Multivibrator.	(7M)
5.b)	Explain Astable Multivibrator as Voltage to frequency converter.	(7M)

(OR)

5.c)	Draw and Explain fixed bias bistable multivibrator.	(7M)
5.d)	Explain triggering in Monostable Multivibrator	(7M)

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Course Code: 20EC4T06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
DIGITAL COMMUNICATIONS (ECE)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain the DPCM system with neat diagram?	(7M)
1.b)	Discuss quantization error in PCM systems?	(7M)
	(OR)	
1.c)	Explain the delta modulation system with suitable diagrams?	(14M)

UNIT-II

2.a)	Explain the generation and detection of PSK.	(7M)
2.b)	Discuss in brief about Non-coherent detection of binary FSK	(7M)
	(OR)	
2.c)	Draw the block diagram of QPSK transmitter & receiver and explain each block in detail.	(14M)

UNIT-III

3.a)	Explain the matched filter with neat sketch.	(7M)
3.b)	Explain in detail about Inter symbol interference and its effects?	(7M)
	(OR)	
3.c)	Define probability of error. Explain how to calculate probability of error using matched filter.	(14M)

UNIT-IV

4.a)	Define entropy. Identify and explain the properties of entropy.	(7M)
4.b)	Explain information rate.	(7M)
	(OR)	
4.c)	The source of information A generates the symbols {A1,A2,A3,A4,A5,A6} with the corresponding probabilities {0.2,0.3,0.11, 0.16,0.18,0.05}. Explain the code for source symbols using Huffman and Shannon-fano encoder and compare its efficiency.	(14M)

UNIT-V

5.a)	Describe the steps involved in the generation of linear block codes.	(7M)
5.b)	Explain about code tree, code trellis and state diagrams. Compare code tree with trellis diagram	(7M)
	(OR)	
5.c)	Illustrate how the errors are corrected using hamming code with an example.	(14M)

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Course Code: 20ES4T11

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations (BR20), April - 2026
ELECTROMAGNETIC WAVES AND TRANSMISSION LINES (ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Derive the characteristic impedance in terms of primary constants of a line.	(7M)
1.b)	Define infinite line, lossless line and distortion less line.	(7M)
	(OR)	
1.c)	Starting from the equivalent circuit, derive the transmission line equation for V and I in terms of the source parameters.	(7M)
1.d)	.b) For lossless line, $Z_0 = 50\ \Omega$ and $\upsilon = 2.8 \times 10^8$ m/s. Determine L and C for the line.	(7M)

UNIT-II

2.a)	Write down the Properties of Smith Chart.	(7M)
2.b)	Explain the significance and utility of $\lambda/8$, $\lambda/4$ and $\lambda/2$ lines.	(7M)
	(OR)	
2.c)	Define Reflection Coefficient? And derive the relationship between Reflection coefficient and VSWR.	(7M)
2.d)	A 50 Ω coaxial cable feeds a 75 + j20 Ω dipole antenna. Find reflection coefficient and standing wave ratio.	(7M)

UNIT-III

3.a)	State and explain Coulomb's law. Obtain an expression in vector form.	(7M)
3.b)	Point Charges 1mC, and -2mC are located at points (3,2,-1) and (-1,-1,4). Find the Force on point charge 10nC located at (0,3,1).	(7M)
	(OR)	
3.c)	State and prove Gauss's law. Express Gauss's law in both integral and differential forms.	(7M)
3.d)	Discuss the salient features and limitations of Gauss's law.	(7M)

UNIT-IV

4.a)	State and explain Faraday's law for induced e.m.f.	(7M)
4.b)	Write the difference between Conduction Current density and displacement current density.	(7M)
	(OR)	
4.c)	What is the inconsistency in Ampere's law? How is it rectified by Maxwell?	(7M)
4.d)	Show that the displacement current through the capacitor is equal to the conduction current.	(7M)

UNIT-V

5.a)	Show that for a good conductor, the surface impedance is equal to the intrinsic impedance.	(7M)
5.b)	Find α, ß, ν and η. for Ferrite at 10GHz $\epsilon r = 9$, $\mu r = 4$, s = 10ms/m.	(7M)
	(OR)	
5.c)	Derive the wave equation for Freespace?	(7M)
5.d)	Explain the terms Brewster's Angle and Total Internal Reflection.	(7M)

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Course Code: 20CS4T02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B. Tech II-Semester Supplementary Examinations (BR20), April - 2026
JAVA PROGRAMMING (CSE)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Explain the important principles of Object Oriented Programming Paradigm.	(7M)
b)	Explain in detail the most significant features of JAVA programming.	(7M)
	(OR)	
1.c)	Discuss in detail about Java data types.	(7M)
d)	What is type casting? Explain with suitable examples.	(7M)
	UNIT-II	
2.a)	What is a Constructor? What is the main purpose of constructors? How to invoke a constructor in JAVA? Give an example.	(7M)
b)	How to share the data among the functions with the help of static keyword? Explain the same with an example.	(7M)
	(OR)	
2.c)	What is constructor overloading? Explain with an example.	(7M)
d)	Explore the use of ***'this'*** keyword with an example.	(7M)
	UNIT-III	
3.a)	Write different types of inheritances in Java and give an example for each.	(7M)
b)	What is an Interface? Give the general form of an Interface and also discuss the implementation details of Interfaces.	(7M)
	(OR)	
3.c)	What is an exception? What are the keywords used for exception handling? Explain.	(7M)
d)	Define package. Explain the process of creating and importing a package.	(7M)
	UNIT-IV	
4.a)	What is meant by thread? Explain about creating thread by implementing Runnable interface.	(7M)
b)	Write a java program to illustrate thread priorities.	(7M)
	(OR)	
4.c)	Explain about thread life cycle.	(7M)
d)	Write a program to illustrate thread synchronization.	(7M)
	UNIT-V	
5.a)	Discuss about AWT components.	(7M)
b)	Write a java program to create Buttons, Checkbox and List Boxes.	(7M)
	(OR)	
5.c)	Write a JAVA program to create EDIT Menu (Cut, Copy, and Paste) of NOTEPAD.	(7M)
d)	What is a Layout manager? Explain in brief about various layout managers supported by JAVA.	(7M)

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Course Code: 20CS4107

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II- B. Tech II-Semester Supplementary Examinations (BR20), APRIL - 2026
OPERATING SYSTEMS (CSE&ALLIED)

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

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Describe the structure of an operating system. Differentiate between monolithic and microkernel architectures.	(7M)
1.b)	What are open-source operating systems? Give examples and explain their advantages.	(7M)
	(OR)	
1.c)	List and explain different types of services provided by an operating system.	(7M)
1.d)	Compare and contrast different operating system structures like monolithic, layered, and microkernel.	(7M)

UNIT-II

2.a)	List and explain common issues in multithreaded programming (e.g., deadlock, starvation).	(7M)
2.b)	Discuss Round Robin and Shortest Job First (SJF) scheduling with examples.	(7M)
	(OR)	
2.c)	Explain how monitors are used for process synchronization.	(7M)
2.d)	What are classical synchronization problems? Briefly explain two of them.	(7M)

UNIT-III

3.a)	Compare and contrast internal fragmentation and external fragmentation with examples.	(7M)
3.b)	Explain the concept of paging. How does it solve the problem of external fragmentation?	(7M)
	(OR)	
3.c)	Define virtual memory. How does it improve system efficiency?	(7M)
3.d)	Explain the working of Least Recently Used (LRU) page replacement algorithm with an example.	(7M)

UNIT-IV

4.a)	Discuss the four Coffman conditions for deadlock. How can each condition be broken to prevent deadlocks?	(7M)
4.b)	Explain deadlock detection with a suitable algorithm. How is recovery from deadlock achieved?	(7M)
	(OR)	
4.c)	What is deadlock avoidance? Explain how the Banker's Algorithm works.	(7M)
4.d)	Describe how circular wait can be prevented. Give a practical example.	(7M)

UNIT-V

5.a)	Explain directory structures. Compare single-level, two-level, and tree-structured directories.	(7M)
5.b)	Discuss file system management and optimization techniques used in modern operating systems.	(7M)
	(OR)	
5.c)	What is disk scheduling? Compare FCFS, SSTF, and SCAN disk scheduling algorithms.	(7M)
5.d)	Explain stable storage implementation. How does it ensure data reliability and recovery?	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II-B.Tech II-Semester Supplementary Examinations (BR20), April - 2026
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (CSE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) (a) Construct truth tables for the following: (7M)
(i) $(p \vee q) \wedge r$ (ii) $(p \downarrow q) \wedge (p \downarrow r)$

1.b) Identify whether the following Inference is valid or Invalid. If Invalid, state the fallacy (7M)

C V D
(C VD)→~H
~H→(A ^ ~B)
(A ^ ~B)→ (R v S)

R V S

(OR)

1.c) Translate the given statements into propositional logic using the propositions provided: (7M)
P: "The message is scanned for viruses"
Q:"The message was sent from an unknown system"
i) "The message is scanned for viruses whenever the message was sent from an unknown system."
ii) "It is necessary to scan the message for viruses whenever it was sent from an unknown system."

1.d) Show that the following is inconsistent $P \rightarrow Q$, $R \rightarrow S$, $P \vee R$, $\sim (Q \vee S)$. (7M)

UNIT-II

2.a) Find the number of equivalence relations that can be defined on a finite set A with $|A|=4$ (7M)

2.b) Prove that the transitive closure R^+ of a relation R on a set A is the smallest transitive relation on A containing R. (7M)

(OR)

2.c) Let A={1, 2, 3, 4} in which ordered pairs are in the relation (7M)
R = {(a, b) | a divides b}.Outline its representation with ordered pairs

2.d) Explain properties of binary relations with examples. (7M)

UNIT-III

3.a) Use characteristic roots method to solve the following recurrence relation $a_n - 7a_{n-1} + 16 a_{n-2} - 12 a_{n-3} = 0$ for $n \geq 3$ and $a_0=1$, $a_1=0$ and $a_2=8$ (7M)

3.b) Let f be function from {a,b,c,d} to {1,2,3,4} with f(a) = 4, f(b) = 2, f(c) = 1 and f(d) = 3. Investigate whether f is one-one, Into and Onto function. Give reasons (7M)

(OR)

3.c) Determine whether the following functions are injective, surjective or bijective. Also describe the inverses of the bijective functions. (7M)

i) The function $f:N \rightarrow N$ with $f(a)=9$ and $f(n) = \begin{cases} 3f(n)+1 & \text{if } f(n) \text{ is odd} \\ \frac{1}{2} f(n) & \text{if } f(n) \text{ is even} \end{cases}$

ii) A function f:A→A satisfying $f(f(x))=f(x)$ for all $x \in A$

3.d) In a lattice (L, $\leq$, $\wedge$, $\vee$) state and prove the laws indempotent, commutative, association and absorption. (7M)

UNIT-IV

4.a) If G is a group and H is a subgroup of index 2 in G, then prove that H is a normal subgroup of G. write in detail about subgroup (7M)

4.b) Find whether (Z,+) and (Z,*) satisfies Semigroup or not where Z be the set of integers and addition, multiplication (+,*) are binary operations. (7M)

(OR)

4.c) Let R denote the group of real numbers with addition and R $*$ denote the group of non-zero real numbers with multiplication. For $x \in R$, $|x|$ denotes the absolute value of x. For each part, determine whether the mapping given is a group homomorphism. Justify your answers briefly. (7M)

4.d) G is a group and there exists two relatively prime positive integers m and n such that $a^m b^m = b^m a^m$ and $a^n b^n = b^n a^n$ for all $a, b \in G$, prove that G is Abelian? (7M)

UNIT-V

5.a) Use any method to solve the following recurrence relation $a_n - 9a_{n-1} + 26a_{n-2} - 24a_{n-3} = 0$ for n=3 with the initial conditions $a_0 = 0, a_1 = 1, a_2 = 10$. (7M)

5.b) Solve the recurrence relation $a_{r+2}-3a_{r+1}+2a_r=0$ (7M)

(OR)

5.c) Using generating functions method solve the following recurrence relation (7M)

$a_n - 6a_{n-1} + 12a_{n-2} - 8a_{n-3} = 0$ for $n \geq 3$.

5.d) Find the 8th term of the sequence $\{a_n\}$ if a_n equals to (7M)

(i) $2n-1$ (ii) $1 + (-1)^n$

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02/05/2026

(AUTONOMOUS)

II-B. Tech II-Semester Supplementary Examinations (BR18), APRIL - 2026

ELECTRICAL MACHINES - II (EEE)

Time: 3 hours **Max. Marks: 60**

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1.	a)	Draw the exact equivalent circuit of a Transformer	(2M)
	b)	Brief the effect of variation of supply voltage on iron losses?	(2M)
	c)	Write short notes on open delta connection in case of a 3-phase transformer connection.	(2M)
	d)	List any two differences between cage rotor and slip ring rotor?	(2M)
	e)	List the methods of speed control of Induction motors.	(2M)
	f)	Brief the working principle of DFIG.	(2M)

PART–B (4X12 = 48M)

2.	a)	Draw and explain the construction and working principle of single phase transformer.	(6M)
	b)	The voltage per turn of a single phase transformer is 1.1V. When the primary winding is connected to a 220V, 50Hz A.C supply, the secondary voltage is found to be 550V. Find: i) Primary and Secondary turns ii) Core area if the maximum flux density is 1.1 wb/m^2.	(6M)
3.	a)	Explain the procedure for conducting OC & SC test along with all precautions to be taken while conducting the test with neat diagram.	(12M)
4.	a)	With the help of neat sketch, explain in detail about parallel operation of single phase transformers.	(6M)
	b)	A 3-phase Y-connected auto-transformer supplies a balanced 3-phase load of 40kW at 380V and at 0.8 p.f lagging. If the supply voltage is 440V determine the currents in the various branches of the auto transformer. Exciting current and internal voltage drops are neglected.	(6M)
5.	a)	With necessary diagrams, explain the production of rotating magnetic field in three phase induction motors.	(6M)
	b)	If a 3-phase induction motor has 6 poles runs at 970rpm when connected to a 50Hz supply, calculate (a) the percentage slip (b) slip speed (c)frequency of rotor currents	(6M)
6.	a)	Derive the expression for maximum torque in a 3-phase Induction Motor.	(6M)
	b)	Explain the procedure of drawing the circle diagram of an induction motor. What information can be drawn from the circle diagram?	(6M)
7.	a)	Discuss Star – Delta starting with necessary diagrams.	(6M)
	b)	Briefly explain construction and operation of Doubly fed Induction generators.	(6M)

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Course Code: 18EC4T07

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
II- B. Tech II-Semester Supplementary Examinations (BR18), April-2026
CONTROL SYSTEMS (ECE)

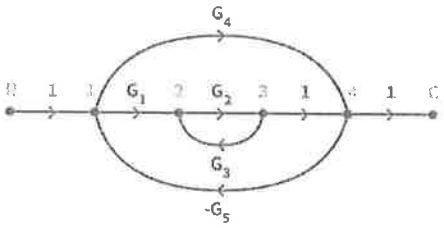
Time: 3 hours **Max. Marks: 60**

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	What are the limitations of transfer function?	(2M)
b)	List the advantages of signal flow graph.	(2M)
c)	List the time domain specifications	(2M)
d)	Define the gain crossover over and phase crossover frequencies.	(2M)
e)	Draw the magnitude plot for a lead compensator.	(2M)
f)	Define controllability.	(2M)

PART–B (4X12 = 48M)

2.a)	Derive the transfer function for the signal flow graph shown below using signal flow graph. 	(6M)
b)	Explain open loop control system and closed loop control system with example.	(6M)
3.a)	Write the equations for time domain specifications of a standard second order system with unit step input?	(6M)
b)	For the system having closed loop transfer function given below $\frac{C(s)}{R(s)} = \frac{4}{s^2+2s+4}$ Determine the time response specifications for a unit step input.	(6M)
4.a)	Apply RH criterion for the equation to determine the stability $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$	(6M)
b)	List all the rules to construct a root locus and explain.	(6M)
5.a)	Draw the bode plot for the unity feedback system with open loop transfer function $G(s) = \frac{10}{s(s^2+5s+6)}$ Hence find gain margin and phase margin.	(6M)
b)	List the frequency domain specifications and define them.	(6M)
6.a)	Explain the design procedure for designing a lag compensator.	(6M)
b)	Realize a lead compensator using electrical components.	(6M)
7.a)	Define state transition matrix and explain its properties.	(6M)

b)	Obtain the state space representation of the following transfer function $G(s) = \frac{s^2 + 2s + 3}{s^3 + 5s^2 + 3s + 2}$	(6M)

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