BR23/BR20/BR 28/04/202

Course Code: **23ES4T12**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular/Supplementary Examinations (BR23), APRIL-2025

ENGINEERING GEOLOGY (CE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions from 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 geology.	BL1	1	(2M)
b)	List few exogenous weathering agents.	BL2	1	(2M)
c)	Define petrology.	BL1	2	(2M)
d)	Classify rock forming and ore forming minerals.	BL2	2	(2M)
e)	Sketch and list parts of fold.	BL2	3	(2M)
f)	Define disconformity.	BL1	3	(2M)
g)	What are seismic belts?	BL1	4	(2M)
h)	What is the principle involved in electrical resistivity method.	BL1	4	(2M)
i)	List the applications of lining for a tunnel.	BL2	5	(2M)
j)	What is gravity dam?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Discuss the various stages in the development of a river.	BL4	1	(10M)
	(OR)			
3.(a)	Explain the biological factors effecting weathering of rock.	BL2	1	(5M)
3.(b)	Discuss about a dam failure with reference to a case study.	BL4	1	(5M)
	UNIT-II			
4.(a)	List the physical properties of the mineral Quartz and Bauxite.	BL2	2	(5M)
4.(b)	What are the advantages of physical study of minerals of over others?	BL1	2	(5M)
	(OR)			
5.	Discuss the various structures of igneous rocks with sketches.	BL3	2	(10M)
	UNIT-III			
6.	Explain the types of faults with neat sketches.	BL2	3	(10M)
	(OR)			
7.	Explain the importance of folds in civil engineering.	BL2	3	(10M)
	UNIT-IV			
8.(a)	Explain the types of ground water.	BL2	4	(5M)
8.(b)	Discuss about cone of depression.	BL3	4	(5M)

3, 4, 2, 11

	(OR)			
9.	Explain the seismic refraction method of geophysical investigation.	BL2	4	(10M)
	UNIT-V			
10.	Discuss the factors considered for selection of site for a tunnel.	BL3	5	(10M)
	(OR)			
11(a)	What are the types of tunnels and write their uses?	BL1	5	(5M)
11(b)	Explain the rock suitability for providing a lining.	BL2	5	(5M)

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(BR23/BR20) Regl/Supply 30/04/

Course Code: **23CE4T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

CONCRETE TECHNOLOGY (Civil Engineering)

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
NOTE: Allow IS code book

PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	List out the Different grades of cements?	L2	1	(2M)
b)	What is bulking of sand?	L1	1	(2M)
c)	List out the various steps in the manufacture of concrete.	L2	2	(2M)
d)	What are the fresh properties of concrete?	L1	2	(2M)
e)	Write the relation between compression and tensile strength.	L3	3	(2M)
f)	Define maturity concept.	L2	3	(2M)
g)	What is Poisson's ratio in concrete?	L1	4	(2M)
h)	Define modulus of elasticity of concrete.	L2	4	(2M)
i)	Write a note on self consolidating concrete.	L3	5	(2M)
j)	What is self healing concrete?	L1	5	(2M)

PART–B (5X10 = 50M)

	UNIT-I			
2.	Explain about the different tests conducted on cement in the laboratory to check its suitability	**L3**	1	(10M)
	(OR)			
3.(a)	Explain about the effect of size of aggregate on concrete.	**L3**	1	(5M)
3.(b)	Discuss in detail about the Bougue's compounds	**L3**	1	(5M)
	UNIT-II			
4.(a)	What is segregation and bleeding of concrete why they occur, discuss how to prevent them	L4	2	(5M)
4.(b)	Write about shotcrete.	L4	2	(5M)
	(OR)			

5.	Mention the different tests which are commonly adopted to measure workability and explain about any two tests.	L4	2	(10M)
	UNIT-III			
6.	Explain the Rebound Hammer test and ultrasonic pulse velocity test.	L3	3	(10M)
	(OR)			
7.(a)	The strength of sample of fully matured concrete is found to be 40Mpa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during day time at 20^0C and night time at 10^0C	L4	3	(5M)
7.(b)	Write about Flexure test of concrete.	L4	3	(5M)
	UNIT-IV			
8.(a)	What is Shrinkage of concrete and discuss about types of shrinkage of concrete.	L3	4	(5M)
8.(b)	What is creep? What are the factors influencing creep?	L3	4	(5M)
	(OR)			
9.	Discuss about the static and dynamic modulus of elasticity of concrete.	L4	4	(10M)
	UNIT-V			
10.	Design a concrete mix of M25 grade. Take standard deviation of 4MPa. The specific gravities of coarse aggregate and fine aggregate are 2.72 and 2.60 respectively. The bulk density of coarse aggregate is 1610 kg/m3 and fineness modulus of aggregate is 2.74.A slump of 60mm is necessary The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2% .Design the concrete mix using IS code method. Assume any missing data.	L4	5	(10M)
	(OR)			
11(a)	Explain salient features of self-healing concrete.	L3	5	(5M)
11(b)	Write about fibre reinforced concrete. What are the factor affecting FRC.	L3	5	(5M)

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Course Code: **23CE4T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

STRUCTURAL ANALYSIS (CE)

Time: 3 hours | Max. Marks: 70

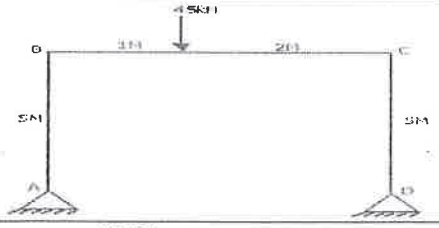
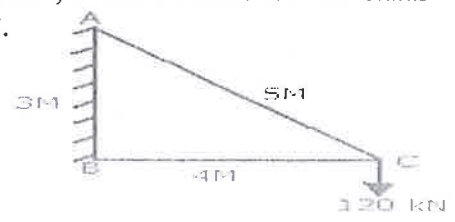
Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

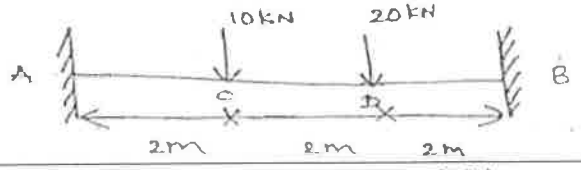
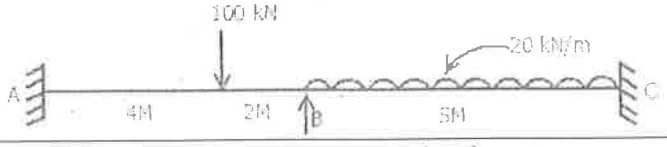
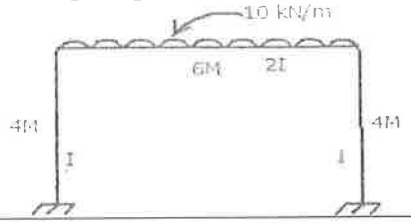
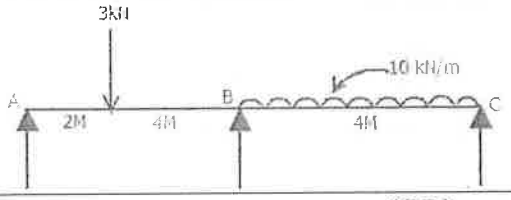
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Proof Resilience.	L1	1	(2M)
b)	State Castigliano's first theorem.	L2	1	(2M)
c)	State Castigliano's theorem-II.	L2	2	(2M)
d)	What is Static and Kinematics indeterminacy of a structure?	L1	2	(2M)
e)	What are the advantages of Fixed beams?	L1	3	(2M)
f)	Draw a shear force and Bending moment diagram for a fixed beam carrying central point load W with a span l metre.	L2	3	(2M)
g)	Discuss the assumptions in the Slope Deflection Method.	L1	4	(2M)
h)	State the Slope Deflection equations when the supports are at Same Level.	L2	4	(2M)
i)	Explain the moment distribution method in brief.	L1	5	(2M)
j)	Discuss the advantages of moment distribution method.	L2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Derive an expression for the Strain Energy due to Bending.	L3	1	(10M)
	(OR)			
3.	Find the depth of the beam if the maximum deflection is limited to 1/1500 of span for a simply supported beam rectangular in section having length 6 metre is subjected to a UDL over its whole span. The Maximum flexural stress is 9.6 N/mm^2. Take $E = 0.15 \times 10^5$ N/mm^2.	L2	1	(10M)
	UNIT-II			
4.	Analyze the Simple portal frame 	L4	2	(10M)
	(OR)			
5.	Find the Vertical and Horizontal deflections at joint c for the truss shown in the figure. The area of inclined member is 2000 mm^2, while the area of horizontal member is 1600 mm^2. Take $E = 200$ kN/mm^2. 	L2	2	(10M)

	UNIT-III			
6.	Evaluate the fixed beam moments as well as the moment at the mid span shown in figure and draw shear force diagram and bending moment diagram. 	L4	3	(10M)
	(OR)			
7.	Find the fixed end moments and draw the bending moment diagram for the beam AB span 4m fixed at A and B carries a uniformly distributed load f 15000 N/m. The support B Sinks by 1 cm. Take E= 2 x 10^5 N/mm^2, I = 8000 cm^4	L2	3	(10M)
	UNIT-IV			
8.	Analyse the continuous beam using Slope Deflection Method 	L4	4	(10M)
	(OR)			
9.	Analyse the portal frame using Slope Deflection Method. 	L4	4	(10M)
	UNIT-V			
10.	Determine the moments over the beam and draw the bending moment diagram. Also calculate the reactions at supports and draw the Shear force diagram for a continuous beam AB 10 metres long rests on three supports A,B and C at the same level and is loaded as shown in figure. 	L2	5	(10M)
	(OR)			
11.	Discuss Moment Distribution Method in detail with various factors also list the various types of continuous beams to which this method can apply.	L3	5	(10M)

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Course Code: **23CE4T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025
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(10×2=20M)			
		Marks	CO	BL
1.a)	What is loss of head due to friction?	2M	1	BL1
b)	A fluid is flowing through a smooth pipe. If the Reynolds number is 2500, Calculate the friction factor using Moody diagram.	2M	1	BL2
c)	Explain the terms Hydraulic mean depth and wetted perimeter.	2M	2	BL2
d)	What is meant by most economical section of channels?	2M	2	BL1
e)	What is gradually varied flow?	2M	3	BL1
f)	Derive the expression for minimum specific energy in terms of Critical depth.	2M	3	BL2
g)	Define efficiency of jet.	2M	4	BL1
h)	How will you classify the turbines?	2M	4	BL1
i)	Draw the main parts of a Centrifugal pump.	2M	5	BL1
j)	What is priming? Why is it necessary?	2M	5	BL2

PART–B (5×10=50M)

	PART-B			
		Marks	**CO**	**BL**
	UNIT-I			
2.a)	What factors determine whether flow in a pipe will be laminar or turbulent?	5M	1	BL2
2.b)	Derive flow of viscous fluid through parallel plates?	5M	1	BL2
	OR			
3.	A smooth pipe of 100mm in diameter and 100m long carriers water at the rate of 0.0075m^3/sec. If the kinematic viscosity of water is 0.02 stokes, calculate Head loss, wall shearing stress and centre line velocity.	10M	1	BL3
	UNIT-II			
4.a)	Derive the condition for most economical trapezoidal channel section.	5M	2	BL4
4.b)	Find the critical depth and critical velocity of water flowing through a rectangular channel of width 5 m, when discharge is 15 m^3/s.	5M	2	BL4
	OR			
5.a)	Find the velocity of flow and rate of flow of water through a rectangular channel of 6m wide and 3m deep, when it is running full. The channel having bed slope as 1 in 2000. Take Chezy's constant C=55	5M	2	BL4

5. b)	An irrigation channel of trapezoidal section, having side slopes 3 horizontal to 2 vertical, is to carry a flow of 10 cumec on a longitudinal slope of 1 in 5000. The channel is to be lined for which the value of friction coefficient of manning's formula is n= 0.0012. Find the dimensions of the most economic section of the channel.	5M	2	BL4
	UNIT-III			
6.a)	State and discuss the assumptions made in the derivation of the dynamic Equation for gradually varied flow.	5M	3	BL4
6.b)	Discuss in detailed Energy Dissipation and its theory.	5M	3	BL3
	OR			
7.a)	A horizontal rectangular channel 4m wide carries a discharge of $16m^3$/sec. Determine whether a jump may 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	BL3
7.b)	A rectangular channel 6meters wide discharges 1440 litres/sec of water into a 6 meter wide apron, with no slope, with a mean velocity of 6 m/see. What is the height of the jump? How much energy absorbed in the jump.	5M	3	BL4
	UNIT-IV			
8.	A jet of water of diameter 10cm moving with a velocity of 35m/s strikes a fixed plate in such a way that the angle between the jet and plate is 700. Find the force exerted by the jet on the plate: (i) In the direction normal to the plate (ii) In the direction of the jet	10M	4	BL4
	OR			
9.a)	Define a draft tube. Derive an expression for efficiency of a draft tube?	5M	4	BL3
9.b)	Obtain an expression for the force exerted by a jet of water on fixed vertical Plate in the direction of the jet.	5M	4	BL4
	UNIT-V			
10.a)	Define the specific speed of a centrifugal pump. Derive an expression for the same.	5M	5	BL3
10 b)	Explain the losses and efficiencies of a centrifugal pump in detail.	5M	5	BL3
	OR			
11.	The diameter of a centrifugal pump, which is discharging 0.035 m^3/s of water against a total head of 25m is 0.05m the pump, is running at 1200rpm. Find the head, discharge and ratio of power of a geometrically similar pump of diameter 0.3m when it is running at 2000 rpm.	10M	5	BL3

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(BR23/BR20)

Course Code: **23HM4T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common for 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)	What is meant by demand in economics?	L1	1	(2M)
b)	State the Law of Demand.	L5	1	(2M)
c)	Define mathematical equation of production function.	L2	2	(2M)
d)	What is Break-Even Point (BEP)?	L1	2	(2M)
e)	Define Sole Proprietorship.	L2	3	(2M)
f)	List any two differences between perfect and imperfect competition.	L1	3	(2M)
g)	Define Internal Rate of Return (IRR).	L2	4	(2M)
h)	What is the Payback Period method?	L1	4	(2M)
i)	Define Financial Accounting.	L2	5	(2M)
j)	What is Double-Entry Bookkeeping System?	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Classify the various types of elasticity of demand with examples.	L2	1	(10M)
	(OR)			
3.(a)	Discuss about the nature of managerial economics.	L2	1	(5M)
3.(b)	Explain about the significance of managerial economics.	L2	1	(5M)
	UNIT-II			
4.(a)	Differentiate the short-run and long-run production function.	L4	2	(5M)
4.(b)	What are the applications of product function?	L1	2	(5M)
	(OR)			
5.	Derive the formula for finding BEP and give a mathematical example. Draw an appropriate an diagram.	L2	2	(10M)
	UNIT-III			
6.	List out the various pricing methods and strategies.	L1	3	(10M)
	(OR)			
7.(a)	Differentiate between Monopoly and Monopolistic Competition.	L4	3	(5M)
7.(b)	What are the main characteristics of an Oligopoly market?	L1	3	(5M)
	UNIT-IV			
8.(a)	What are the different types of working capital? Give brief explanations.	L1	4	(5M)
8.(b)	Explain about the nature and significance of capital budgeting.	L2	4	(5M)
	(OR)			

9.	A firm considering three projects each with an initial investment of Rs. 20000 and life of 4 years. The following is the list of estimated cash inflows after taxes:	L5	4	(10M)

Years	Proposal-I	Proposal-II	Proposal-III
1	12500	11750	13500
2	12500	12250	12250
3	12500	12250	12250
4	12500	13500	11750
Total	**50000**	**50000**	**50000**

Determine NPV and Rank them when k=12%.

UNIT-V

10.	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.	L5	5	(10M)
	(OR)			
11(a)	Classify the various types of accounts.	L2	5	(5M)
11(b)	Recommend the advantages of double entry bookkeeping.	L5	5	(5M)

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Course Code: **23ES4T13**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II-B.Tech II-Semester Regular End Examinations (BR23), April-2025

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)	What is the operating point of a BJT?	1	1	(2M)
b)	Write the condition for thermal runaway in BJTs?	2	1	(2M)
c)	What is the significance of bandwidth in amplifiers?	2	2	(2M)
d)	Mention the role of coupling and bypass capacitors in frequency response?	2	2	(2M)
e)	What is the purpose of the R-C network in a phase shift oscillator?	1	3	(2M)
f)	Define an ideal Op-Amp?	1	3	(2M)
g)	Mention any two differences between an integrator and a differentiator?	2	4	(2M)
h)	What is a comparator?	2	4	(2M)
i)	Define the function of a Schmitt Trigger?	1	5	(2M)
j)	What are the different applications of PLL?	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	With the help of a circuit, derive the load line equation and discuss how the Q-point is established in a BJT?	3	1	(10M)
	(OR)			
3.(a)	Explain the operation of a positive clamper circuit with a neat diagram and waveform?	4	1	(5M)
3.(b)	Explain the operation of clipping circuit.	4	1	(5M)
	UNIT-II			
4.(a)	Draw the circuit diagram of a Voltage series feedback amplifier, Derive expressions of input & output impedances, and Gain?	3	2	(5M)
4.(b)	Compare CE, CB, and CC amplifier configurations based on voltage gain and input/output impedance?	2	2	(5M)
	(OR)			

5.	With neat diagrams, describe the complete frequency response of a CE amplifier and discuss the parameters that affect bandwidth?	4	2	(10M)

UNIT-III

6.	With neat diagrams, explain the working of a Wien Bridge oscillator and derive the frequency of oscillation?	4	3	(10M)

(OR)

7.(a)	Define the Op-Amp and also write and explain the symbolic diagram of Op-Amp.	3	3	(5M)
7.(b)	Discuss any five characteristics of an ideal Op-Amp?	4	3	(5M)

UNIT-IV

8.(a)	Explain the operation of a V-to-I converter using Op-Amp?	3	4	(5M)
8.(b)	Explain how an Op-Amp can be used as a differentiator?	4	4	(5M)

(OR)

9.	Illustrate the working of a square wave generator using Op-Amps and derive the expression for frequency?	3	4	(10M)

UNIT-V

10.	With a neat diagram, explain the working of a 555 timer in monostable and astable modes. Mention two applications for each?	3	5	(10M)

(OR)

11(a)	Describe the working principle of an R-2R ladder DAC?	4	5	(5M)
11(b)	Write short notes on DAC specifications like resolution, accuracy, and monotonicity?	3	5	(5M)

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Course Code: **23EE4T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Explain the function of Electrostatic precipitator in thermal power plant.	2	1	(2M)
b)	Why the thermal power plant efficiency low?	2	1	(2M)
c)	Differentiate between Fission and fusion.	2	2	(2M)
d)	What do you understand by Beam radiation and diffuse radiation?	2	2	(2M)
e)	Explain the function of control rods in nuclear reactor.	1	3	(2M)
f)	List the different types of Bus bar arrangements.	1	3	(2M)
g)	Mention different methods of cable grading.	1	4	(2M)
h)	What is the purpose of using inter sheath in a cable?	1	4	(2M)
i)	Write the significance of load factor.	2	5	(2M)
j)	What is three part tariff?	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Draw the layout of hydro electric power plant and describe the major component with their usage.	2	1	(10M)
	(OR)			
3.(a)	What are the various parts & their function of a steam power station?	2	1	(5M)
3.(b)	Explain the functions of Cooling tower and condenser with respect to a Thermal power station.	2	1	(5M)
	UNIT-II			
4.(a)	With a neat sketch explain the various parts of a nuclear reactor.	2	2	(5M)
4.(b)	Write short notes on PWR type nuclear reactor with neat sketch.	2	2	(5M)
	(OR)			
5.	Illustrate the working principle of nuclear reactor and also discuss the factors affecting the choice of site selection for nuclear power plant.	2	2	(10M)

UNIT-III

6.	List in detail about the functionality equipment available in substation	2	3	(10M)
	(OR)			
7.(a)	Differentiate between air insulated substation and Gas Insulated Substation.	4	3	(5M)
7.(b)	Discuss the advantages and disadvantages of a main and transfer bus scheme.	2	3	(5M)

UNIT-IV

8.(a)	Explain the general construction of an underground cables.	2	4	(5M)
8.(b)	A 3 phase 3 core 8 km long belted cable tested for capacitance between a pair of cores with the third is earthed gave a result of 0.6 μ F/km. Calculate the charging current of the cable when connected to 33 kV, 3-phase, 50 Hz supply.	3	4	(5M)
	(OR)			
9.	A 11 kV, 50 Hz, single-phase cable has a diameter of 10 mm and an internal sheath radius of 15 mm. If the dielectric has a relative permittivity of 24, determine for a 2.5 km length cable: (i) The capacitance. (ii) The charging current.	3	4	(10M)

UNIT-V

10.	A generating station is to supply four regions of load whose peak loads are 10 MW, 5 MW, 8 MW and 7 MW . The diversity factor at the station is 1.5 and average annual load factor is 60% . Calculate (i) the maximum demand on the station (ii) Annual energy supplied by the station.	3	5	(10M)
	(OR)			
11(a)	Define and explain the importance planning required generation (a) Connected Load (b) demand factor (c) average load (d) diversity factor.	4	5	(5M)
11(b)	Discuss the objectives and requirements of tariff.	2	5	(5M)

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Course Code: **23EE4T06**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

INDUCTION AND 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)	The frequency of the EMF in the stator of a 8 pole induction motor is 50Hz, Find the speed of the motor?	2	1	(2M)
b)	Draw the power flow diagram of Three-phase induction motor?	2	1	(2M)
c)	What are the types of starters used in Three-phase induction motors?	1	2	(2M)
d)	List out the methods of speed control of cage type Three-phase induction motor?	1	2	(2M)
e)	Draw the equivalent circuit of single phase induction motor?	2	3	(2M)
f)	What are the applications of single phase induction motor?	1	3	(2M)
g)	What is coil span factor?	1	4	(2M)
h)	Define voltage regulation of an Alternator?	1	4	(2M)
i)	Where the synchronous condenser used?	1	5	(2M)
j)	List out the applications of synchronous motor?	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain the effects of slip on various parameters of the 3-phase induction motor?	2	1	(10M)
	(OR)			
3.(a)	Explain how Rotating Magnetic Field is produced in a 3- phase induction motor?	2	1	(5M)
3.(b)	Explain the construction and working principle of 3-phase slip ring induction motors?	2	1	(5M)
	UNIT-II			
4.(a)	Sketch and explain the torque-slip Characteristics of Three Phase Induction motor?	3	2	(5M)
4.(b)	Write a brief note on induction generator?	2	2	(5M)
	(OR)			
5.	A 3-Phase, 400V induction motor gave the following test readings: No-Load: 400V, 1250W, 9, A Short-circuit: 150V, 4 KW, 38A Draw the circle diagram, If the normal rating is 20.27 hp (metric), find from the circle diagram, the full-load values of current, Power factor and slip.	4	2	(10M)
	UNIT-III			
6.	Explain about the Double field revolving theory for single phase induction motors?	2	3	(10M)

	(OR)			
7.(a)	Explain the construction and working of AC series motor?	2	3	(5M)
7.(b)	Explain the construction and operation of the Capacitor start and capacitor run induction motor and draw the torque-speed characteristics?	3	3	(5M)
	UNIT-IV			
8.(a)	A 3-Phase, 16 Pole Alternator has star Connected winding 144 slots and 10 conductors per slot. The flux per pole is 0.04wb and is distributed sinusoidal. The speed is 375 rpm. Find the frequency, Phase emf and line emf. The coil span is 120° electrical.	3	4	(5M)
8.(b)	With a neat sketch describe the construction and Principle of operation of salient and Non salient Pole Alternator?	3	4	(5M)
	(OR)			
9.	A 3-Phase,6000V,50Hz,star connected Alternator having an per phase Resistance of 0.62Ω gave the following results: If (A) : 14 18 23 30 43 Voc(V): 4000 5000 6000 7000 8000 A field current of 17A is found necessary to circulate the full load current using EMF method find the voltage regulation of the Alternator supplying the full load of 200KVA at 0.707 lag	4	4	(10M)
	UNIT-V			
10.	Explain with help of Phasor Diagram the effect of excitation on current and power factor of a Synchronous Motor?	3	5	(10M)
	(OR)			
11(a)	Explain hunting in synchronous motors and also explain how it can be minimized?	2	5	(5M)
11(b)	List out the various methods for the starting of synchronous motors. Explain any two methods?	2	5	(5M)

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Course Code: **23EE4T07**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

CONTROL SYSTEMS (EEE)

Time: 3 hours Max. Marks: 70

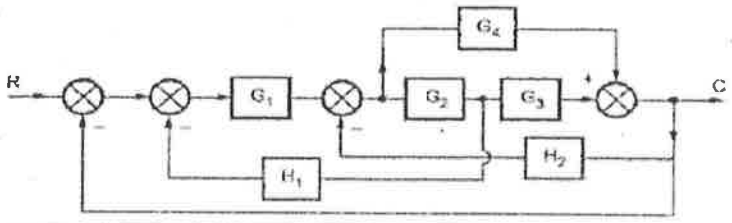
Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is feedback? What type of feedback is employed in control systems?	1	1	(2M)
b)	Explain Mason's gain formula.	2	1	(2M)
c)	Define rise time and delay time.	1	2	(2M)
d)	Define steady state error.	1	2	(2M)
e)	What is centroid? How is centroid Calculated?	1	3	(2M)
f)	Distinguish between polar plot and Nyquist plot.	1	3	(2M)
g)	Draw the electrical equivalent circuits of lead-lag compensator.	2	4	(2M)
h)	Draw the pole-zero plot of the lead compensator.	2	4	(2M)
i)	Define controllabililty and observability.	1	5	(2M)
j)	Write the formula to derive the transfer function from the given state model.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	What are the differences between open loop and closed loop control systems?	1	1	(5M)
(b)	List the procedure and properties of signal flow graph.	2	1	(5M)
	(OR)			
3.	Using Block diagram reduction technique find the Transfer Function of the system. 	3	1	(10M)
	UNIT-II			
4.	List out the time domain specifications and write the expressions for Rise time, Peak time and Peak overshoot and represent in the second order system.	2	2	(10M)
	(OR)			

5.a.	Define the following terms i)Absolute stability ii) Marginal stability iii) Conditional stability.	1	2	(5M)
b.	By means of RH criterion determine the stability of the system represented by the characteristic equation $S^4 + 2S^3 + 9S^2 + 8S + 4 = 0$.	3	2	(5M)
	UNIT-III			
6.	Sketch the polar plot of the system whose open loop transfer function is $G(s) = \frac{10}{s(s+1)(s+3)}$	1	3	(10M)
	(OR)			
7.	Using bode plots, determine the stability of the unity feedback control system with the following open loop transfer function. $G(s) = \frac{3}{s(s+1)(s+5)}$	3	3	(10M)
	UNIT-IV			
8.	Obtain the transfer function of Lead Compensator, draw pole-zero plot and write the procedure for design of Lead Compensator using Bode plot.	3	4	(10M)
	(OR)			
9.	Explain the procedural steps to design a phase lag compensator using Bode analysis.	4	4	(10M)
	UNIT-V			
10.a.	State the properties of State Transition Matrix.	1	5	(5M)
b.	Explain the concept of controllability with an example.	2	5	(5M)
	(OR)			
11	Obtain a state model for the system whose Transfer function is given by G(s) H(s) = $(7S^2+12S+8)/(S^3+6S^2+11S+9)$	3	5	(10M)

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Course Code:23BS4110

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

COMPLEX VARIABLES PROBABILITY & SATASTICS (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)	Find the value of $\int_0^{1+i} z^2 dz$.	2	1	(2M)
b)	State Cauchy's integral formula	1	1	(2M)
c)	Define the terms Essential and Removable singularity of an analytic function *f(z)*.	1	2	(2M)
d)	Extend $f(z) = e^z$ as Taylor's series about $z = 1$.	2	2	(2M)
e)	State Baye's theorem	1	3	(2M)
f)	20% of items produced from a goods factory are defective. If we choose 5 items randomly then Calculate the probability of non-defective item.	2	3	(2M)
g)	How many different samples of size n=2 can be chosen from a finite population of size 25.	2	4	(2M)
h)	Define Point estimation.	1	4	(2M)
i)	Define Type-I and Type-II errors.	2	5	(2M)
j)	In a manufacturing company out of 200 goods 80 were faulty. Find the sample proportion.	2	5	(2M)

PART–B (5X10 = 50M)

2.	Construct the analytic function f(z) whose real part of it is $u = e^x[(x^2 - y^2)cosy - 2xysiny)]$.	3	1	(10M)
	(OR)			
3.(a)	Compare Cauchy general integral formula with $\int_C \frac{1}{e^z(z-1)^3} dz$ and estimate the value of integral with $C: \lvert z \rvert = 2$.	3	1	(5M)
3.(b)	Find the value of line integral to $\int_C (z^2 + 3z)dz$ along the straight line from *(2,0) to (2,2)* and then from *(2,2) to (0,2).*	2	1	(5M)
4.(a)	Extend $f(z) = \frac{7z-2}{z(z+1)(z-2)}$ about $z=-1$ in the region $1 < \lvert z+1 \rvert < 3$ as Laurent's series.	3	2	(5M)
4.(b)	Extend $f(z) = \cos z$ in Taylor's series about $z = \pi i$.	2	2	(5M)
	(OR)			

2, 4, 7, 8, 11

5.	Solve the value of $\int_c \frac{2z-1}{z(2z+1)(z+2)}dz$ where c is the circle $\|z\| = 1$ by using Residue theorem.			(10M)
6. (a)	If X denote the sum of the two numbers that appear when a pair of fair dice is tossed. Estimate the (i) Distribution function (ii) Mean and (iii) Variance.	3	3	(10M)
	(OR)			
7.(a)	A car-hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days (i) on which there is no demand (ii) on which demand is refused.	3	3	(5M)
7.(b)	The probability that a man hitting a target is 1/3. If he fires 5 times, the probability that he fires (i) At most 3 times (ii) At least 2 times	3	3	(5M)
8.(a)	Find 95% confidence limits for the mean of a normality distributed population from which the following sample was taken 15, 17,10,18,16, 9, 7, 11, 13 and 14.	3	4	(5M)
8.(b)	The mean height of students in a college is 155 cms and standard deviation is 15. What is the probability that the mean height of 36 students is less than 157 cms.	2	4	(5M)
	(OR)			
9.	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 the sampling distribution of means	3	4	(10M)
10.	The no. of automobile accidents per week in a certain area as follows: 12,8,20,2,14,10,15,6,9,4. Are these frequencies in agreement with the belief that accidents were same in the during last 10 weeks	3	5	(10M)
	(OR)			
11(a)	It is claimed that a random sample of 49 tires has a mean life of 15200 kms This sample was taken from population whose mean is 15150 kms and S.D is 1200 km Examine the truth value of the claim at 0.05 level of significant.	3	5	(5M)
11(b)	If 48 out of 400 persons in rural area possessed 'cell' phones while 120 out of 500 in urban area. Can it be accepted that the proportion of 'cell' phones in the rural area and Urban area is same or not. Use 5% of level of significance.	3	5	(5M)

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Course Code: **23ME4T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

MANUFACTURING PROCESSES (MECH)

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 materials used for pattern?	BL1	1	(2M)
b)	Write any Two casting defects	BL2	1	(2M)
c)	What is arc welding?	BL1	2	(2M)
d)	Write the working principle of laser beam welding	BL2	2	(2M)
e)	Define cold working	BL1	3	(2M)
f)	Define forging.	BL1	3	(2M)
g)	Define shearing.	BL2	4	(2M)
h)	What is metal spinning process	BL2	4	(2M)
i)	List Types of materials used for additive manufacturing	BL2	5	(2M)
j)	Define VAT AM process?	BL1	5	(2M)

PART–B (5X10 = 50M)

	UNIT-I			
2.	Explain pattern allowance and their construction?	BL2	1	(10M)
	(OR)			
3.(a)	Explain the purpose of Gate and Riser	BL2	1	(5M)
3.(b)	Explain centrifugal casting process with a neat sketch	BL2	1	(5M)
	UNIT-II			
4.(a)	Give the advantages and limitations of gas welding.	BL3	2	(5M)
4.(b)	Explain MIG welding process with a neat sketch.	BL2	2	(5M)
	(OR)			
5.	Explain Laser Beam welding with a neat sketch.	BL3	2	(10M)

	UNIT-III			
6.	What is forging and explain open die forging with a neat sketch.	BL2	3	(10M)
	(OR)			
7.(a)	Explain forward extrusion with a sketch.	BL3	3	(5M)
7.(b)	Explain wire drawing with a sketch.	BL2	3	(5M)
	UNIT-IV			
8.(a)	Explain Deep drawing operation?	BL2	4	(5M)
8.(b)	Explain types of presses	BL2	4	(5M)
	(OR)			
9.	Explain bending operation and types of bending operations.	BL2	4	(10M)
	UNIT-V			
10.	Explain Classification of additive manufacturing processes?	BL2	5	(10M)
	(OR)			
11(a)	Explain Extrusion Based AM process?	BL2	5	(5M)
11(b)	Explain the steps involved in additive manufacturing process?	BL2	5	(5M)

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Course Code: 23ME4T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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 viscosity.	BTL1	1	(2M)
b)	Define surface tension on a liquid jet.	BTL1	1	(2M)
c)	What are the types of flows?	BTL1	2	(2M)
d)	What is Darcy-Weisbach Equation?	BTL1	2	(2M)
e)	Explain about separation of Boundary layer?	BTL1	3	(2M)
f)	What is fundamental and derived quantities?	BTL1	3	(2M)
g)	What are the differences between impulse and reaction turbine.	BTL1	4	(2M)
h)	What is the formula for work done on a flat moving inclined plate?	BTL1	4	(2M)
i)	What is cavitation.	BTL1	5	(2M)
j)	What are the differences between centrifugal pump and reciprocating pump.	BTL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	A U-Tube manometer is used to measure the pressure of water in a pipe line, which is in excess of atmosphere pressure. The right limb of the manometer contains mercury and is open to atmosphere. The contact between water and mercury is in the left limb. Determine the pressure of water in the main line, If the difference in level of mercury in the limbs of U-tube is 10 cm and the free surface of mercury is in level with the centre of the pipe. If the pressure of water in pipe line is reduced to 9810 N/m^2, calculate the new difference in the level of mercury. Sketch the arrangements in both cases.	BTL3	1	(10M)
	(OR)			
3.(a)	Explain the terms meta-centre and meta-centre height.	BTL2	1	(5M)
3.(b)	A pontoon of 15696 kN displacement is floating in water. A weight of 245.25 kN is moved through a distance of 8m across the deck of pontoon. Which tilts pontoon through an angle 4°. Find meta-centric height of the pontoon.	BTL3	1	(5M)
	UNIT-II			
4.(a)	Water is flowing through a pipe having diameter 300 mm and 200 mm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 24.525 N/cm^2 and the pressure at the upper end is 9.81 N/cm^2. Determine the difference in datum head if the rate of flow through pipe is 40 lit/s.	BTL3	2	(5M)

4.(b)	A horizontal venturimeter with inlet diameter 20 cm and throat diameter 10 cm is used to measure the flow of water. The pressure at inlet is 17.658 N/cm2 and the vacuum pressure at the throat is 30 cm of mercury. Find the discharge of water through venturimeter. Take $C_d = 0.98$	BTL3	2	(5M)
	(OR)			
5.	A horizontal pipe line 40 m long is connected to a water tank at one end and discharges freely into the atmosphere at the other end. For the first 25 m of its length from the tank, the pipe is 150 mm diameter and its diameter is suddenly enlarged to 300 mm. The height of water level in the tank is 8m above the centre of the pipe. Considering all losses of head which occur, determine the rate of flow. Take f = 0.01 for both sections of the pipe.	BTL3	2	(10M)
	UNIT-III			
6.	Define boundary layer. Explain displacement thickness on a flowing fluid.	BTL3	3	(10M)
	(OR)			
7.(a)	The efficiency η of a fan depends on the density ρ, the dynamic viscosity μ of the fluid, the angular velocity ω, diameter D of the rotor and the discharge Q. Express η in terms of dimensionless parameters using Rayleigh's method.	BTL3	3	(5M)
7.(b)	Find the expression for the power P using Buckingham's π-Theorem, developed by a pump when P depends upon the head H, the discharge Q and specific weight of the fluid.	BTL3	3	(5M)
	UNIT-IV			
8.(a)	Find the force on the inclined plate moving in the direction of the jet.	BTL3	4	(5M)
8.(b)	A jet of water of diameter 50 mm moving with a velocity of 40 m/s, strikes a cured fixed symmetrical plate at the centre. Find the force exerted by the jet of water in the direction of the jet, if the jet is deflected through an angle of 120° at the outlet of the curved plate.	BTL3	4	(5M)
	(OR)			
9.	As inward flow reaction turbine has external and internal diameters as 1.0 m and 0.6 m respectively. The hydraulic efficiency of the turbine is 90% when the head on the turbine is 36 m. The velocity of flow at outlet is 2.5 m/s and discharge at outlet is radial. If the vane angle at outlet is 15° and width of the wheel is 100 mm at inlet and outlet, determine: (i) the guide blade angle, (ii) speed of the turbine, (iii) vane angle of the runner at inlet, (iv) volume flow rate of turbine and (v) power developed.	BTL3	4	(10M)
	UNIT-V			
10.	What is specific speed and derive the Specific speed of the turbine.	BTL3	5	(10M)
	(OR)			
11(a)	The outer diameter of an impeller of a centrifugal pump is 400 mm and outlet width is 50 mm. The pump is running at 800 r.p.m. and is working against a total head of 15 m. The vanes angle at outlet is 40° and manometric efficiency is 75%. Determine: (i) velocity of flow at outlet, (ii) velocity of water leaving the vane, (iii) angle made by the absolute velocity at outlet with the direction of motion at outlet, and (iv) discharge.	BTL3	5	(5M)
11(b)	Derive the discharge and work done by Reciprocating pump.	BTL3	5	(5M)

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Course Code: 23ME4105

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Define Degrees of Freedom.	1	1	(2M)
b)	What are the inversion of single slider crank chain mechanism?	2	1	(2M)
c)	How will you determine the magnitude and direction of coriolis component of acceleration?	2	2	(2M)
d)	Write short notes on Coincident point?	2	2	(2M)
e)	State law of gearing.	2	3	(2M)
f)	What is the effect of gyroscopic couple on rolling of ship? Why?	2	3	(2M)
g)	Define undercutting in cam. How is occurs?	2	4	(2M)
h)	What is meant by balancing of rotating masses?	1	4	(2M)
i)	What is meant by free vibration and forced vibration?	1	5	(2M)
j)	Why smaller fly wheels are used in multi cylinder engines.	2	5	(2M)

PART–B (5X10 = 50M)

2.a)	What do you understand by a copied straight line and generated straight lineMechanism?	2	1	(10M)
	(OR)			
2.(c)	Explain the fourth inversion of single slider crank mechanism with neat sketch.	2	1	(5M)
2.(d)	Sketch a four-bar crank rocker mechanism in (1) Maximum transmission angle position and (2) toggle position where mechanical advantage is infinity.	2	1	(5M)
3.(a)	Define rubbing velocity at a pin joint. What will be the rubbing velocity at pin joint when the two links move in the same and opposite directions?	3	2	(5M)
3.(b)	In a pin jointed four bar mechanism, Crank AB = 300 mm, BC = CD = 360 mm, and fixed link AD = 600 mm. The angle BAD = 60°. The crank AB rotates uniformly at 100 r.p.m. Locate all the instantaneous centres and find the angular velocity of the link BC.	3	2	(5M)
	(OR)			
3.c)	The Crank of a slider crank mechanisms rotates clockwise at a Constant speed of 300 r.p.m. The crank is 150 mm and connecting rod is 600 mm long. Determine 1. Linear velocity and acceleration of the mid Point of the connecting rod, and 2. Angular velocity and angular acceleration of the connecting rod, at a crank angle of 45° from inner dead centre position.	4	2	(10M)

4.a)	A pair of involute spur gears with 16° pressure angle and pitch of module 6 mm is in mesh. The number of teeth on pinion is 16 and its rotational speed is 240 r.p.m. When the gear ratio is 1.75, find in order that the interference is just avoided; 1. the addenda on pinion and gear wheel ; 2. the length of path of contact ; and 3. the maximum velocity of sliding of teeth on either side of the pitch point.	4	3	(10M)
	(OR)			
4.c)	State and prove the law of gearing. Show that involute profile satisfies the conditions for correct gearing.	3	3	(5M)
4.d)	What is the effect of gyroscopic couple on the pitching and rolling of ship.	3	3	(5M)
5.(a)	Explain clearly the terms 'static balancing' and 'dynamic balancing'. State the necessary conditions to achieve them.	3	4	(5M)
5.(b)	Four masses A, B, C and D revolve at equal radii and are equally spaced along the shaft. The mass B is 6 kg and radii of masses C and D make 90^0 and 240^0 with respect to mass B. Determine the magnitude of the masses A, C and D and the angular position mass A so that system may be completely balanced.	4	4	(5M)
	(OR)			
5.c)	A cam is to be designed for a knife edge follower with the following data: 1. Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion. 2. Dwell for the next 30°. 3. During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion. 4. Dwell during the remaining 180°. Draw the profile of the cam when (a) the line of stroke of the follower passes through the axis of the cam shaft, and (b) the line of stroke is offset 20 mm from the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.	4	4	(10M)
6.a)	The turning-moment diagram of a four-stroke engine is assumed to be represented by four triangles, the areas of which from the line of zero pressure are Suction stroke = 440 mm^2 (Below zero line) Compression stroke = 1600 mm^2 (Below zero line) Expansion stroke = 7200 mm^2 (above zero line) Exhaust stroke = 660 mm^2 (Below zero line) Each mm^2 of area represents 3 N.m of energy. If the resisting torque is uniform, determine the mass of the rim of a flywheel to keep the speed between 218 and 222 rpm when the mean radius of the rim is to be 1.25 m.	4	5	(10M)
	(OR)			
6.c)	A cantilever shaft 50 mm diameter and 300 mm long has a disc of mass 100 kg at its free end. The Young's modulus for the shaft material is 200 GN/m^2. Determine the frequency of longitudinal and transverse vibrations of the shaft.	3	5	(5M)
6.d)	What do you mean by the whirling of shafts? What is critical speed? Explain with neat sketch.	2	5	(5M)

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Course Code: **23HM4T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Define industrial engineering.	1	1	(2M)
b)	Define preventive maintenance.	1	1	(2M)
c)	What is micro motion study.	2	2	(2M)
d)	Define MTM.	1	2	(2M)
e)	Define control chart.	1	3	(2M)
f)	What is zero defect concept.	1	3	(2M)
g)	Explain NPV.	2	4	(2M)
h)	Explain stock management.	2	4	(2M)
i)	Define wage incentive.	2	5	(2M)
j)	What is supply chain management.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain F.W. Taylor's scientific management.	2	1	(10M)
	(OR)			
3.(a)	What are the features, advantages and disadvantages of Process Layout?	2	1	(5M)
3.(b)	Discuss the objectives and importance of Plant maintenance.	2	1	(5M)
	UNIT-II			
4.(a)	Discuss different types of production.	2	2	(5M)
4.(b)	Discuss Therbligs.	2	2	(5M)
	(OR)			
5.	Discuss the steps involved in Time Study.	2	2	(10M)
	UNIT-III			
6.	Compare single and double sampling plan.	2	3	(10M)
	(OR)			

7.(a)	Explain quality circles.	2	3	(5M)
7.(b)	What do you understand by Six Sigma?	2	3	(5M)

UNIT-IV

8.(a)	Explain ratio analysis.	2	4	(5M)
8.(b)	Discuss working capital and its estimation.	2	4	(5M)

(OR)

9.	Explain payback period and ARR with example.	2	4	(10M)

UNIT-V

10.	Evaluate any four methods of Merit rating.	2	5	(10M)

(OR)

11(a)	Explain value engineering.	2	5	(5M)
11(b)	What are the various functions within an organization which are integrated through an ERP?	2	5	(5M)

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Course Code: **23ES4T14**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech-II Semester Regular End Examinations (BR23), APRIL-2025

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

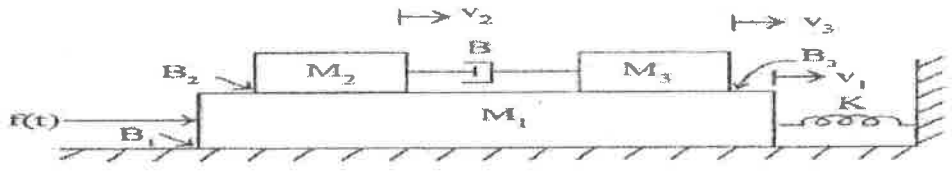
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define the closed loop system	1	1	(2M)
b)	Compare open loop control system and closed loop control system.	2	1	(2M)
c)	List the advantages of Signal Flow Graph.	4	2	(2M)
d)	Explain about Rise time & Damping ratio	5	2	(2M)
e)	Discuss about Auxiliary Equation in Routh-Hurwitz stability criterion.	6	3	(2M)
f)	Solve Centroid for the open loop control system having transfer function $G(s)=K/(S+1)(S+3)$	3	3	(2M)
g)	Discuss the procedure to sketch the Nyquist plot of a given function.	6	4	(2M)
h)	Define Gain cross over frequency in bode plot	1	4	(2M)
i)	Explain about State Model Equations?	5	5	(2M)
j)	List the Properties of State Transition Matrix.	4	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Determine the transfer function $V_3(S)$ / $F(S)$ of the mechanical translational system shown below	**5**	1	(10M)

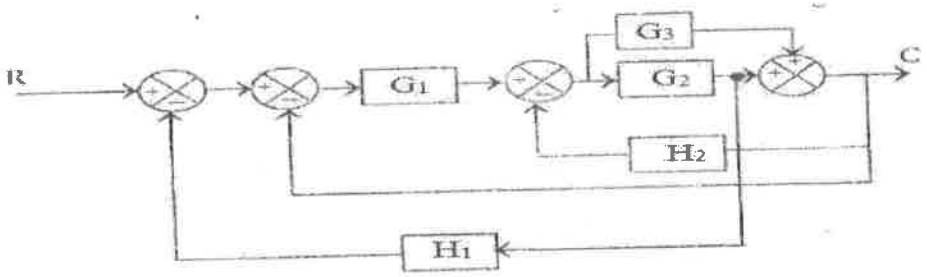


(OR)

3.(a)	Compare Negative Feed Back system and Positive Feed Back system	**2**	1	(5M)
3.(b)	Define sensitivity of a control system. Discuss the effect of feedback on sensitivity.	**2**	1	(5M)

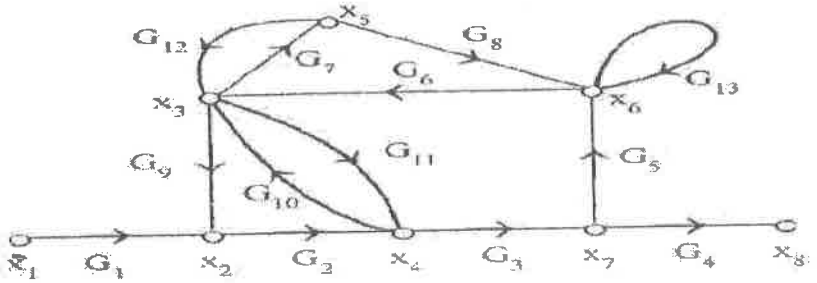
UNIT-II

4.(a)	Derive the transfer function and develop the block diagram of AC servo motor.	6	2	(5M)
4.(b)	Find the closed loop transfer function of control system shown below figure	5	2	(5M)



(OR)

5.	Find the transfer function of the system shown in figure using Mason's gain formula?	3	2	(10M)



UNIT-III

6.	Sketch the root locus diagram for a unity feedback system with its open loop function as $$G(S)=\frac{K(S+3)}{S(S^2+2S+2)(S+5)(S+9)}$$	6	3	(10M)

(OR)

7.(a)	Explain different conditions for stability using RH criteria.	2	3	(5M)
7.(b)	Explain the limitations of Routh's stability criterion	2	3	(5M)

UNIT-IV

8.(a)	Explain how polar plot is used to find the stability of the system	4	4	(5M)
8.(b)	Illustrate the advantages of frequency response analysis?	2	4	(5M)

(OR)

9.	Draw bode plot for the open loop transfer function is given below and determine the gain margin and phase margin? $$G(s)H(s)=\frac{4}{(s+2)(s+4)(s+5)}$$	6	4	(10M)

UNIT-V

10. The state equation of a linear time-invariant system is given below — 5 — 5 — (10M)

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

Determine the following:

i) State transition matrix

ii) Controllability of the system

(OR)

11(a) With neat diagram, explain the function of PID compensation in detail? — 4 — 5 — (5M)

11(b) Explain the advantages of lag-lead compensator — 2 — 5 — (5M)

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Course Code: **23EC4T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Mention the types of transmission lines	BTL1	CO1	(2M)
b)	Define Infinite Line and Lossless line.	BTL2	CO1	(2M)
c)	For a transmission line VSWR is 4. What is the reflection coefficient?	BTL3	CO2	(2M)
d)	List the applications of smith chart.	BTL2	CO2	(2M)
e)	Write the Poisson's and Laplace equations.	BTL4	CO3	(2M)
f)	Define convection and conduction currents.	BTL1	CO3	(2M)
g)	State Ampere's circuit law.	BTL2	CO4	(2M)
h)	Define Ampere's Force Law.	BTL1	CO4	(2M)
i)	What is meant by Total Internal Reflection?	BTL2	CO5	(2M)
j)	Define surface impedance and skin depth	BTL1	CO5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Derive the primary and secondary constants for a low loss transmission line.	BTL3	CO1	(10M)
	(OR)			
3.(a)	Derive the expression for propagation constant of infinite transmission line.	BTL3	CO1	(5M)
3.(b)	A transmission line has R=5Ω/m, L=0.1μH, C=300pF and G=0.01℧ at 500MHz, determine α, β, Z_O.	BTL4	CO1	(5M)
	UNIT-II			
4.(a)	What is input impedance of transmission line and explain nature of different lengths of lines when short circuited and open circuited.	BTL2	CO2	(5M)
4.(b)	A transmission line of length 0.3λ has a characteristic impedance of 100Ω and is terminated in a load of impedance of 200+j180Ω. Find reflection coefficient, VSWR and input impedance.	BTL4	CO2	(5M)
	(OR)			
5.	Write a detailed notes on i) Single Stub Matching ii) Quarter Wave Transformer.	BTL2	CO2	(10M)

UNIT-III

6.	Using Gauss's law, derive expressions for electric field intensity and electric flux density due to an infinite sheet of conductor of charge density ρ_s C/cm.	BTL3	CO3	(10M)
	(OR)			
7.(a)	Discuss the two Maxwell's equations for electrostatic fields.	BTL2	CO3	(5M)
7.(b)	A Parallel-plate capacitor with plate area of $5cm^2$ and Plate separation of 3 mm has a voltage $50\sin10^3t$ V applied to its plates. Calculate the Displacement Current assuming $\varepsilon = \varepsilon_0$.	BTL4	CO3	(5M)

UNIT-IV

8.(a)	State and explain Biot-Savart's law with necessary equations.	BTL2	CO4	(5M)
8.(b)	Explain the concept of Magnetic scalar and vector potential.	BTL2	CO4	(5M)
	(OR)			
9.	Derive Maxwell's equations in integral and differential form for time varying fields. Also Write Maxwell's equations in word Statements.	BTL3	CO4	(10M)

UNIT-V

10.	Derive wave propagation characteristics in a lossy dielectric?	BTL3	CO5	(10M)
	(OR)			
11(a)	What is poynting theorem? Derive the expression for poynting vector in differential and integral forms.	BTL2	CO5	(5M)
11(b)	An EM wave travelling in air is incident normally on boundary between air and a dielectric having permeability same as free space and permittivity as 4. Prove that one-ninth of the incident power is reflected and eight-ninths of it is transmitted into the second medium.	BTL4	CO5	(5M)

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Course Code: **23EC4T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Draw the circuit of FET common Drain amplifier at high frequencies.	BTL1	1	(2M)
b)	Define hybrid-π model capacitances?	BTL2	1	(2M)
c)	List two advantages of RC coupling in multistage amplifiers?	BTL1	2	(2M)
d)	In Multistage amplifier Av_1= 15, Av_2=20 & Av_3=25 find out overall gain of multistage amplifier?	BTL2	2	(2M)
e)	List two advantages of negative feedback amplifiers.	BTL1	3	(2M)
f)	A feedback amplifier reduces the gain from 200 to 40. Find the amount of feedback applied?	BTL2	3	(2M)
g)	State the Barkhausen criterion for sustained oscillations?	BTL1	4	(2M)
h)	Find out the frequency of Wien bridge oscillator if the resistor is 2kΩ and capacitor is 10μf?	BTL2	4	(2M)
i)	Draw graphical representation of class 'A' Power Amplifier.	BTL3	5	(2M)
j)	Define the Q-factor in tuned amplifiers?	BTL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Derive the expressions for the following hybrid Π conductance i) g_m ii) $g_{b'e}$ iii) $g_{b'c}$ iv) g_{ce} v) $g_{bb'}$.	BTL4	1	(10M)
	(OR)			
3.(a)	Analyze the common Source Amplifier circuit at high frequencies.	BTL4	1	(5M)
3.(b)	Compare the high-frequency response of a BJT CE amplifier and a FET CS amplifier, both designed for midband gain of 10. Use appropriate model parameters?	BTL4	1	(5M)
	UNIT-II			
4.(a)	With neat circuit diagram. Explain cascode Amplifier.	BTL3	2	(5M)
4.(b)	Analyze the performance of a Darlington pair amplifier and derive its input resistance.	BTL4	2	(5M)
	(OR)			
5.	Compare and evaluate the performance of three amplifier configurations—Darlington pair, Cascode amplifier, and Bootstrapped emitter follower—in terms of input impedance, voltage gain, and bandwidth. Use suitable plots.	BTL3	2	(10M)

UNIT-III

6.	Draw the block diagram of feedback amplifier and explain each block.	BTL3	3	(10M)
	(OR)			
7.(a)	An amplifier has a gain of 50 with negative feedback. For a specified output voltage. If the input required is 0.1V without feedback and 0.8V with feedback, Compute β and open loop gain?	BTL3	3	(5M)
7.(b)	Derive input and output resistance of voltage shunt feedback Amplifier.	BTL4	3	(5M)

UNIT-IV

8.(a)	Derive frequency of oscillations for Colpitt's oscillator.	BTL4	4	(5M)
8.(b)	Analyze the effect of component variations on frequency and amplitude stability in oscillators.	BTL4	4	(5M)
	(OR)			
9.	Explain the operation of a Wien Bridge oscillator and derive an expression for its frequency of operation and barkhausen criteria	BTL3	4	(10M)

UNIT-V

10.	Compare the performance of different classes (A to C) of power amplifiers. Highlight trade-offs between conduction angle, efficiency and distortion.	BTL4	5	(10M)
	(OR)			
11	Derive the efficiency of pushpull class B power Amplifier with neat diagrams.	BTL4	5	(10M)

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Course Code: **23EC4T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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)	Define Amplitude Modulation and draw the AM waves for $\mu<1$, $\mu>1$ and $\mu=1$.	BL2	1	(2M)
b)	A 400 watts carrier is modulated to a depth of 75percent. Find the total power in the amplitude modulated wave.	BL3	1	(2M)
c)	State the need for suppressed carrier modulation.	BL2	2	(2M)
d)	Write the time domain expressions of DSB-SC, SSB-SC.	BL2	2	(2M)
e)	State Carson's rule and how can you differentiate NBFM with WBFM.	BL1	3	(2M)
f)	Generate a FM signal from a PM generator and Vice Versa.	BL1	3	(2M)
g)	What is Image Frequency and how to reject it?	BL1	4	(2M)
h)	Define Sensitivity, Selectivity and Fidelity.	BL1	4	(2M)
i)	Consider a message signal and a carrier signal; draw corresponding PAM, PWM and PPM waveforms.	BL2	5	(2M)
j)	Define figure of merit.	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	With suitable expressions and diagram, explain the generation of AM using square law modulator?	BL2	1	(10M)
	(OR)			
3.	Explain the square law detection process.	BL2	1	(10M)
	UNIT-II			
4.	Generate a DSB-SC wave by using balance modulator.	BL2	2	(10M)
	(OR)			
5.	Write about COSTAS Loop and Squaring Loop.	BL2	2	(10M)

UNIT-III

6.(a)	A single tone F is represented by $v(t) = 12\cos[6X10^6t+5Sin1250t]$. Determine carrier frequency, modulation index, maximum deviation, What power will this FM wave dissipate across a 10ohm resistor.	BL3	3	(5M)
6.(b)	A 107.6MHz carrier signal is frequency modulated by a 7KHz sine wave. The resultant FM signal has a frequency deviation of 50KHz. Determine Carrier swing. Highest and lowest frequencies and modulation index.	BL3	3	(5M)
	(OR)			
7.	Explain the FM detection using Phase Locked Loop.	BL2	3	(10M)

UNIT-IV

8.	Draw the block diagram of a Tuned Radio Frequency receiver and explain its operation. What are the advantages of this receiver?	BL2	4	(10M)
	(OR)			
9.	With neat sketch, explain the functionality of FM transmitter using Armstrong method.	BL2	4	(10M)

UNIT-V

10.	Derive the Figure Merit of FM.	BL3	5	(10M)
	(OR)			
11	Explain the generation and detection of PAM wave.	BL2	5	(10M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

PROBABILITY AND STATISTICS (CSE/AI&ML/CSE(AIML))

Time: 3 Hours **Max Marks: 70**

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

		PART A	MARKS	CO
1	a)	Find the median from 57,58,61,42,38,65,72,66	2M	1
	b)	Describe the measures of central tendency	2M	1
	c)	State bayes theorem	2M	2
	d)	If a bank received on the average 6 bad cheques per day find the probability that it will receive 4 bad cheques on any given day	2M	2
	e)	The size of the population is 2000 and the size of the sample is 200. Find the correction factor in the population	2M	3
	f)	If we can assert with 95% that the maximum error is 0.05 and p=0.2, find the size of the sample	2M	3
	g)	Define null hypothesis and alternate hypothesis	2M	4
	h)	Explain the applications of χ^2 distribution	2M	4
	i)	Write the types of correlation	2M	5
	j)	Write the formulae for the angle between two regression lines	2M	5

PART B

UNIT I

2	a	Discuss briefly about collection of data	3 M	1
	b	Calculate the mean and median from the following data	7 M	1

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	12	28	20	10	10

OR

3	a	Calculate the Karl pearson's coefficient of skewness for the following data.	10 M	1

Class interval	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	2	5	7	13	21	16	8	3

UNIT II

4	a	A random variable X has the following probability distribution	5 M	2

X	1	2	3	4	5	6	7	8
P(X)	K	2K	3K	4K	5K	6K	7K	8K

Find the values of i) K ii) $P(x\leq 2)$ iii) $P(2\leq x\leq 5)$

	b	Ten coins are thrown simultaneously. Find the probability of getting at least seven heads.	5 M	2

2, 4, 7, 8, 9, 10

OR

5	a	Suppose 10% of the probability of normal distribution is below 35 and 5% is above 90. Then find the mean and variance of the distribution	10 M	2

UNIT III

6	a	A population consists of five numbers 3,6,9,15,24,27. Consider all possible samples of size two which can be drawn with replacement from this population. Find (i) The mean of population (ii) The S.D. of population (iii) The mean of the sampling distribution of means (iv) The standard deviation of the sampling distribution of means	10 M	3

OR

7	a	If a 1-gallon can of paint cover on an average 513 squares feet with a standard deviation of 31.5 Square feet what is the probability that mean are covered by a sample of 40 of these 1-gallon cans will be anywhere from 510 to 520 square feet	5 M	3
	b	A random sample of 100 is taken from a population with S.D is 5% given that the sample mean is 21.65. construct a 95% confidence interval for the population mean	5 M	3

UNIT IV

8	a	In a random sample of 60 workers, the average time taken by them to get to work is 33.8 minutes with standard deviation of 6.1minutes can we relate the null hypothesis $\mu=32.6$ minutes in favour of alternative hypothesis $\mu>32.6$ minutes at $\alpha=0.05$ level of significance.	5 M	4
	b	A manufacturer claimed that at least 45% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test the claim that at 5% level of significance	5 M	4

OR

9	a	The dynamic modulus of concrete is obtained for two different concrete mixes. For the first mix $n_1=33$, $\bar{x}=115.1$ and $S_1=0.47$ for the second mix $n_2=31$, $\bar{Y}=114.6$ and $S_2=0.38$ test with $\alpha=0.05$, the null hypothesis of equality of mean dynamic modulus vs. the two sided alternative	5M	4
	b	A sample of 26 bulbs given a mean life of 990 hours with S.D of 20 hours manufacture claims that the mean life of bulbs is 1000 hours. Is the sample not up to the standard?	5M	4

UNIT V

10	a	Fit a straight line to the form $y=a+bx$ for the following data x: 0, 5, 10, 15, 20, 25 y: 12, 15, 17, 22, 24, 30	5M	5
	b	Calculate the correlation coefficient for the following height (in inches) of father x and their son y X: 65, 66, 67, 67, 68, 69, 70, 72 Y: 67, 68, 65, 68, 72, 72, 69, 71	5M	5

OR

11	a	Fit s second degree polynomial $y=a+bx+cx^2$ by the method of least squares to the following data. x: 10, 12, 15, 23, 20 y: 14, 17, 23, 25, 21	10M	5

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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 (CSE, 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)	List any four process management system call	1	1	(2M)
b)	What are the advantage and disadvantage of multiprocessor system?	1	1	(2M)
c)	Define the concept of threads and describe the issues associated with concurrency.	1	2	(2M)
d)	What is meant by CPU-bound process?	1	2	(2M)
e)	Define mutual exclusion.	1	3	(2M)
f)	What is a critical section and what requirements must a solution to the critical section problem satisfy?	1	3	(2M)
g)	Compare the differences between logical and physical addresses	2	4	(2M)
h)	What is the need for disk scheduling	1	4	(2M)
i)	Explain the objectives for a file management system	2	5	(2M)
j)	Demonstrate file system mounting, and how does it enable access to files across multiple partitions?	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain the different operating system services	2	1	(10M)
	(OR)			
3.(a)	Explain the structure of operating system.	2	1	(5M)
3.(b)	Explain the process of building and booting an operating system.	2	1	(5M)
	UNIT-II			
4.(a)	Define a process. Explain process scheduling in detail.	2	2	(5M)
4.(b)	What is thread? Explain thread structure.	2	2	(5M)
	(OR)			
5.	Explain about the IPC (Inter Process Communication).	3	2	(10M)
	UNIT-III			
6.	What is Semaphore? Give the implementation of Readers-Writers Problem using Semaphore.	3	3	(10M)

	(OR)			
7.	What is Deadlock? Explain Deadlock prevention & Avoidance.	2	3	(10M)
	UNIT-IV			
8.	Simplify the following page reference string1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults would occur for the following replacement algorithms, assuming four frames? The Remember all frames are initially empty, so your first unique pages will all cost one fault each.LRU replacement, FIFO replacement.	4	4	(10M)
	(OR)			
9.	Explain the concept of paging in memory management. Discuss the structure of the page table.	2	4	(10M)
	UNIT-V			
10.	Compare and contrast different file allocation methods. Discuss their advantages and disadvantages in terms of efficiency and ease of implementation.	4	5	(10M)
	(OR)			
11,	Write in detail about Theon-diskandin-memory structures used to implement a file system.	2	5	(10M)

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Course Code: **23CS4T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::
ODALAREVU (AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

DATABASE MANAGEMENT SYSTEMS (CSE/AI&ML/CSE (AI&ML))

Time: 3hours Max.Marks:70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-Bconsistsof5questionswitheither/orchoice, answeranyonefromeither/orchoice

PART–A (10X2 = 20M)

		BTL	CO	**Marks**
1.a)	What are the applications of DBMS?	1	1	(2M)
b)	What are super key, primary key, candidate key, and foreign key?	2	1	(2M)
c)	What is the difference between DML and DDL?	1	2	(2M)
d)	What is a weak entity? Explain with an example.	1	2	(2M)
e)	What is a view in SQL? How to create a view?	1	3	(2M)
f)	What is the difference between a trigger and a stored procedure?	2	3	(2M)
g)	What is database normalization?	1	4	(2M)
h)	What is a surrogate key? Explain with an example.	1	4	(2M)
i)	What is a transaction? What are ACID properties?	1	5	(2M)
j)	What is a serial schedule?	1	5	(2M)

PART–B(5X10=50M)

		BTL	CO	**Marks**
	UNIT-I			
2.	Describe in detail about two-tier and three-tier client-server architecture for the database.	**3**	1	(10M)
	(OR)			
3.(a)	Explain about centralized architecture for DBMS.	**2**	1	(5M)
3.(b)	Explain the concept of Data independence.	**2**	1	(5M)
	UNIT-II			
4.(a)	Explain about domain and key constraints with examples.	2	2	(5M)
4.(b)	What is simple database schema?	2	2	(5M)
	(OR)			

5.(a)	Write short notes on: i) DDL ii) DML iii) Database Schema.	3	2	(5M)
5.(b)	Give the form of a basic SQL query. Write SQL queries to demonstrate the usage of SQL date and time data types and functions.	4	2	(5M)
	UNIT-III			
6.(a)	What is SQL single row function? By means of suitable examples illustrate the usage of SQL date, character and number functions.	3	3	(5M)
6.(b)	Explain string conversion function in SQL.	2	3	(5M)
	(OR)			
7.(a)	Explain about relational set operations.	3	3	(5M)
7.(b)	What is a aggregate function? List and explain how to use aggregate functions in SQL with appropriate example.	2	3	(5M)
	UNIT-IV			
8.(a)	What is normalization? Explain 1NF, 2NF and 3NF with suitable example.	3	4	(5M)
8.(b)	With a suitable example, illustrate the concept of dependency preserving decomposition.	4	4	(5M)
	(OR)			
9.(a)	Explain about Boyce-Codd Normal Form (BCNF).	1	4	(5M)
9.(b)	Define functional dependency and state full, partial, transitive, multi-valued and join dependencies.	2	4	(5M)
	UNIT-V			
10.(a)	How does the lock manager implement lock and unlock requests? Explain.	2	5	(5M)
10.(b)	Explain recovery with concurrent transaction.	6	5	(5M)
	(OR)			
11.(a)	Explain about Hash-Based Indexing.	2	5	(5M)
11.(b)	Construct a B+ tree for the following set of key values: 2, 3, 5, 7, 11, 17, 19, 23, 29, 31.	2	5	(5M)

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Course Code: 23CS4T06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

Software Engineering (CSE/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 are the Characteristics of Software?	L2	1	(2M)
b)	What are the Various Categories of Software?	L2	1	(2M)
c)	What are Software Project Estimation Techniques Available?	L2	2	(2M)
d)	What is SRS?	L2	2	(2M)
e)	What is Cohesion and Coupling?	L2	3	(2M)
f)	Mentions Some Software Analysis and Design Tools?	L1	3	(2M)
g)	Define the terms: i) Smoke Testing ii) Statistical Testing	L1	4	(2M)
h)	How is debugging related to testing?	L3	4	(2M)
i)	What are CASE Tools?	L2	5	(2M)
j)	Define software Maintenance?	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain Software Development Life Cycle. Discuss various activities during SDLC.	L2	1	(10M)
	(OR)			
3.(a)	What are the Notable changes in software development practices?	L2	1	(5M)
3.(b)	Describe Exploratory style of software developments?	L1	1	(5M)
	UNIT-II			
4.(a)	Describe five desirable characteristics of a good software requirement specification document.	L1	2	(5M)
4.(b)	How do you Identify and analyze potential risks in a software project?	L3	2	(5M)
	(OR)			

3, 9, 7, 8, 11

5.	Discuss Empirical Estimation techniques with Examples?	L2	2	(10M)
	UNIT-III			
6.	Draw a Data Flow Diagram for Hospital Management System?	L3	3	(10M)
	(OR)			
7.(a)	Discuss the mechanism of conducting Component Level Design?	L2	3	(5M)
7.(b)	Why the Agile process is chosen than conventional process? Explain.	L2	3	(5M)
	UNIT-IV			
8.(a)	Describe the Role of Software Quality Assurance in software engineering.	L1	4	(5M)
8.(b)	What is Capability Maturity Model (CMM)? Discuss it's levels?	L2	4	(5M)
	(OR)			
9.	What is Black Box Testing? Explain the technique specifying rules and its usage with the help of an example?	L2	4	(10M)
	UNIT-V			
10.	What is software Reverse Engineering? What are the goals of Reverse Engineering?	L2	5	(10M)
	(OR)			
11(a)	What is software maintenance? Explain its Characteristics?	L2	5	(5M)
11(b)	What is a CASE? Explain Towards Second generation of CASE Tool?	L1	5	(5M)

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Course Code: **23ES4T15**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End 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 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 the purpose of heat maps in identifying patterns.	BL2	1	(2M)
b)	Define Exponential distribution.	BL2	1	(2M)
c)	What is point estimation and give an example	BL2	2	(2M)
d)	Define Null Hypothesis	BL1	2	(2M)
e)	Write the normal equations to fit a second degree parabola	BL2	3	(2M)
f)	Explain how multiple regression expands on simple regression.	BL2	3	(2M)
g)	Define Time series and give an example	BL2	4	(2M)
h)	What is method of least squares	BL1	4	(2M)
i)	Highlight a key application of logistic regression.	BL1	5	(2M)
j)	State an advantage of using logistic regression in classification tasks.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2. (a)	What is Principal Component Analysis (PCA), and why is it used in data visualization?	BL3	1	(5M)
2. (b)	Write the characteristics of a normal distribution curve.	BL2	1	(5M)
	(OR)			
3.	Fit a binomial distribution to the following data, when tossing 5 coins. x: 0 1 2 3 4 5 f: 2 14 20 34 22 8	BL3	1	(10M)
	UNIT-II			
4.(a)	Describe the steps involved in hypothesis testing.	BL2	2	(5M)
4.(b)	For a sample of size 30 with a mean of 50 and a standard deviation of 10, test whether the sample come from the population with mean is 55. ($t_{(29df,\ 5\%\ LOS)}$= 2.045)	BL3	2	(5M)
	(OR)			

2, 4, 7, 8, 10, 11

5.	Two independent samples of 8 and 7 items respectively has the following values Sample-I 11 11 13 11 15 9 12 14 Sample-II 9 11 10 13 9 8 10 - Is the difference between the means of samples significant.	BL4	2	(10M)

UNIT-III

6.	Fit an exponential curve of the form $Y=ab^x$ to the following data: X 1 2 3 4 5 6 7 8 Y 1.0 1.2 1.8 2.5 3.6 4.7 6.6 9.1	BL3	3	(10M)

(OR)

7.(a)	Explain the relationship between categorical explanatory variables and regression.	BL2	3	(5M)
7.(b)	Calculate the equation of the line of regression of y on x for the following data x 1 2 3 4 5 y 2.1 2.5 3.6 4.0 4.9	BL3	3	(5M)

UNIT-IV

8.(a)	Describe the steps involved in moving average methods.	BL2	4	(5M)
8.(b)	Discuss seasonal variations and their importance.	BL3	4	(5M)

(OR)

9. Workout the cantered 4-yearly moving average for the following data: BL3 4 (10M)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Tonnage of good's carried	2204	2500	2360	2680	2424	2634	2904	3098	3172
Year	1999	2000	2001						
Tonnage of good's carried	2952	3248	3172						

UNIT-V

10(a)	Compare logistic regression with linear regression.	BL2	5	(5M)
10(b)	What are the different types of classification problems? Explain with examples.	BL4	5	(5M)

(OR)

11(a)	What is a hash function, and what role does it play in hash-based indexing?	BL3	5	(5M)
11(b)	Explain how logistic regression addresses classification problems.	BL3	5	(5M)

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Course Code: 23AD4T01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

INTRODUCTION TO DATA SCIENCE (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 Data Science and Big Data.	1	1	(2M)
b)	What are the common errors in retrieving data, and which cleansing solutions should be employed?	1	1	(2M)
c)	Illustrate the various Python tools.	1	2	(2M)
d)	List out any four applications of machine learning.	1	2	(2M)
e)	Mention the ACID Principles of relational databases.	1	3	(2M)
f)	Sate the BASE principle of NoSQL databases.	1	3	(2M)
g)	What are the Python libraries for handling text mining and analysis?	1	4	(2M)
h)	What are the main features of Neo4j.	1	4	(2M)
i)	Outline the steps involved in developing a dashboard for a real-world problem using the data science process.	1	5	(2M)
j)	How to create an interactive dashboard using dc.js.	1	5	(2M)

PART–B (5X10 = 50M)

	UNIT-I			
2.	Explore the various steps associated with the data science process with explain any 3 steps with a suitable diagram and example.	**2**	1	(10M)
	(OR)			
3.(a)	List and describe the facets of data science.	**1**	1	(5M)
3.(b)	Describe the Big Data Ecosystem. Discuss its components and their roles in the processing and analysis of large datasets.	**2**	1	(5M)
	UNIT-II			

4.(a)	Discuss the role of machine learning in the field of data science.	2	2	(5M)
4.(b)	Examine the types of machine learning. Provide examples of when each type would be most appropriate to use.	3	2	(5M)
	(OR)			
5.	Write a brief note on Feature Engineering with Python	1	2	(10M)
	UNIT-III			
6.	Describe in detail the Hadoop framework system.	2	3	(10M)
	(OR)			
7.(a)	Elaborate the CAP theorem in detail.	3	3	(5M)
7.(b)	List and explain the types of NoSQL databases.	2	3	(5M)
	UNIT-IV			
8.(a)	How Neo4j used to deal with graph databases. Explain.	2	4	(5M)
8.(b)	What are the Python libraries used for handling text mining and analysis? Discuss.	2	4	(5M)
	(OR)			
9.	Explore the applications of graph databases in various fields. Discuss how graph databases can be used to model and analyze complex relationships.	3	4	(10M)
	UNIT-V			
10.	Illustrate how Crossfilter and dc.js work together to create interactive dashboards. Discuss the benefits of using these tools for data exploration	2	5	(10M)
	(OR)			
11(a)	Evaluate the process of developing a dashboard using modern tools.	3	5	(5M)
11(b)	How the Data Science process is used to solve real-world problems. Justify with your answer.	2	5	(5M)

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Course Code: **23HM4T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

OPTIMIZATION TECHNIQUES (CSE (AI&DS/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)	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, Surplus variables 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)

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.	2	1	(5M)
4.(a)	Maximize the function Z=6x+5y *Subject to* **2x-3y≤5, x+3y≤11, 4x+y≤15 and x,y≥0** using graphical method	3	2	(5M)
4.(b)	Discuss Simplex algorithm with respect to Linear Programming Problem	2	2	(5M)

3, 4, 8, 10, 11

5.	Solve the following Linear programming problem by Simplex method. Minimize $z = x_1 - 2x_2 + x_3$ Subject to: $x_1 + 2x_2 - 2x_3 \le 4;\ x_1 - x_3 \le 3;\ 2x_1 - x_2 + 2x_3 \le 2$ $x_1, x_2, x_3 \ge 0$	3	2	(10M)
6.	Determine the basic feasible solution for the transportation matrix given below using Vogel approximation method.	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	

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 $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$	3	4	(10M)
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 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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Course Code: **23AM4T01**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II-B.Tech II-Semester Regular End Examinations (BR23), April-2025
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)	Summarize the role of data acquisition in the machine learning workflow.	L2	1	(2M)
b)	Interpret the term "feature engineering" with respect to improving model performance.	L2	1	(2M)
c)	Define proximity measures with an example.	L1	2	(2M)
d)	Differentiate between KNN classifier and KNN regression.	L2	2	(2M)
e)	What are impurity measures in decision trees?	L2	3	(2M)
f)	What do you understand by regression using decision trees?	L2	3	(2M)
g)	Explain the concept of linear discriminants in classification.	L2	4	(2M)
h)	What is the role of the kernel trick in non-linear SVM?	L1	4	(2M)
i)	What is the difference between hard and soft clustering?	L1	5	(2M)
j)	Explain the concept of clustering in machine learning.	L2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Discuss the different paradigms of machine learning and explain how they differ in approach.	L2	1	(10M)
	(OR)			
3.(a)	Explain the sequence of stages involved in the machine learning process, starting from data acquisition to model prediction.	L2	1	(5M)
3.(b)	Describe the process of model evaluation and prediction. Include its significance.	L3	1	(5M)
	UNIT-II			
4.(a)	Describe how K-Nearest Neighbor (KNN) algorithm works for classification	L2	2	(5M)
4.(b)	Explain the concept of Radius Distance Nearest Neighbor and how it differs from standard KNN.	L2	2	(5M)
	(OR)			
5.	Discuss the performance evaluation techniques for classification & Regression algorithms.	L3	2	(10M)
	UNIT-III			
6.	Explain how random forests improve classification and regression tasks.	L2	3	(10M)
	(OR)			
7.(a)	Describe the workflow of building a random forest model.	L2	3	(5M)
7.(b)	Describe the key properties of decision trees.	L2	3	(5M)

	UNIT-IV			
8.(a)	Describe the structure and working of Multi-Layer Perceptrons (MLPs)?	L2	4	(5M)
8.(b)	Describe Linear Regression with suitable example.	L2	4	(5M)
	(OR)			
9.	Explain the functioning of logistic regression in binary classification?	L2	4	(10M)
	UNIT-V			
10.	Describe the working of fuzzy C-means clustering?	L2	5	(10M)
	(OR)			
11(a)	Discuss the concept of K-means clustering with an example.	L2	5	(5M)
11(b)	What is spectral clustering? Explain its process and applications.	L2	5	(5M)

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Course Code: **23AM4T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech II Semester Regular End Examinations (BR23), APRIL-2025

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 decimal number $(25.625)_{10}$ into its binary and hexadecimal equivalents.	2	1	(2M)
b)	What is a universal gate? Provide two examples.	1	1	(2M)
c)	Define a Flip-Flop. Enumerate its various types.	1	2	(2M)
d)	Define a multiprocessor system. Briefly explain its types.	2	2	(2M)
e)	Differentiate signed and unsigned numbers.	2	3	(2M)
f)	What elements are in basic processing unit (CPU) with diagram?	1	3	(2M)
g)	Differentiate between access time and cycle time in memory systems.	3	4	(2M)
h)	List different types of ROM along with one application of each.	2	4	(2M)
i)	Explain how hardware interrupts differ from software interrupts.	2	5	(2M)
j)	What are the standard I/O interfaces?	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain the IEEE 754 standard for floating-point representation with emphasis on single and double precision formats.	2	1	(10M)
	(OR)			
3.	Using a Karnaugh Map, minimize $F(A,B,C,D) = \Sigma(1,4,5,6,7,12,13,14,15)$.	4	1	(10M)
	UNIT-II			
4.(a)	Explain various types of shift registers with block diagrams and applications.	2	2	(5M)
4.(b)	Design and explain a ripple counter with a timing diagram.	3	2	(5M)
	(OR)			
5.	Explain the basic operational concepts of a computer	2	2	(10M)
	UNIT-III			
6.	Illustrate Booth's multiplication algorithm with a neat diagram and suitable example.	3	3	(10M)
	(OR)			
7.	Explain the stages involved in the instruction cycle with a flow diagram.	2	3	(10M)

	UNIT-IV			
8.	Analyze the characteristics and usage of different semiconductor RAM types.	3	4	(10M)
	(OR)			
9.	Discuss the different levels of the memory hierarchy and the principles behind their organization.	2	4	(10M)
	UNIT-V			
10.	Discuss the different types of buses used in a computer system and their characteristics	2	5	(10M)
	(OR)			
11	Define interface circuits. Explain the working of I/O interface using handshake protocol.	3	5	(10M)

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