R20

III B.TECH II SEM

REGULAR & SUPPLEMENTARY END EXAMINATIONS

APRIL 2024

NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Regular & Supple. Examinations, April-2024

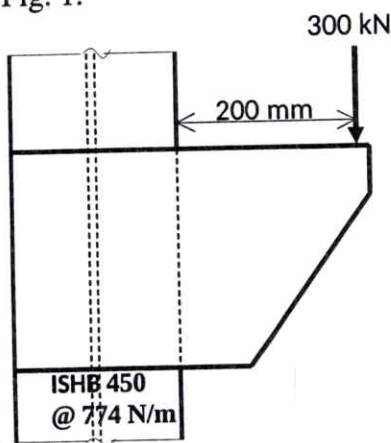Sub Code: R20CE3201   DESIGN AND DRAWING OF STEEL STRUCTURES
(CE)   Max. Marks: 70
Time: 3 hours

Answer any ONE Question from Part – A & Any THREE Questions from Part – B

Q.No	Questions	KL	CO	Marks
	PART A			
1	Design a battened column, using two channels back-to-back, subjected to design axial load of 1800 kN. The length of the column is 9 m and is to be restrained against rotation and translation at both ends. Also, draw the cross-sectional and longitudinal details of the battened column.	4	2	[28M]
	OR			
2	Design a gusset base for a column ISHB 350 @ 774 N/m subjected to factored axial load of 2000 kN. The column is to be supported on a M25 grade concrete pedestal. Draw the details of the gusset base.	4	4	[28M]
	PART B			
3	Design a bolted bracket connection to support a design load of 300 kN as shown in Fig. 1. Fig. 1	4	1	[14M]
4	Design a single angle section tension member subjected to an axial force of 160 kN. The angle section is to be connected to the gusset plate using M20 bolts of grade 4.6.	4	2	[14M]
5	Design a laterally unsupported simply supported beam of span 6 m subjected to uniformly distributed working load of 40 kN/m. Assume that full torsional restraint and compression flange partially restrained against warping are provided at the supports and the load acting of the beam will have normal effect.	4	3	[14M]
6	Design an I-column subjected to a factored axial load of 900 kN in addition to factored moments of 60 kNm and 45 kNm with respect to major and minor axes, respectively.	4	2	[14M]
7	Design a gantry girder to carry an overhead travelling crane for an industrial building using the following data: Capacity of the crane: 200 kN, Weight of crane excluding trolley: 125 kN Weight of trolley: 50 kN, Center-to-center distance between gantry girders: 15 m Minimum approach of crane hook: 1.5 m, Center-to-center distance between crane wheels: 3.0 m, Span of gantry girder: 9 m, Self-weight of rail section: 0.3 KN/m, Yield stress of steel: 250 N/mm²	4	5	[14M]

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CE3202　　　**ENVIRONMENTAL ENGINEERING**

Time: 3 hours　　　　　　　　　　(CE)　　　　　　　Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks　(5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) With the help of neat sketches, explain Infiltration gallery and Infiltration well?	K1	1	7M
			ii) Enlist any four types of pumps usually used in water supply systems and the main factors which are to be considered while selecting a suitable pump.	K2	1	7M
			OR			
	b		i) Define intake works in a water supply scheme? With the help of a neat figure, explain any one type of intake structure?	K2	1	7M
			ii) Explain the significance and analysis of any four important physical characteristics and any six chemical characteristics of drinking water.	K2	1	7M
			Unit-II			
2	a		i) Distinguish between slow sand and rapid gravity filters?	K2	2	7M
			ii) Design a mechanical rapid mix unit for treating water at the rate of $6000 m^3$ / day. Assume a detention period of 30 seconds and velocity gradient of $600 \ s^{-1}$.	K4	2	7M
			OR			
	b		i) Design the principal components of a Rapid sand filter including manifold and under drainage system for treating 4 MLD of water?	K4	2	7M
			ii) A circular sedimentation tank (bottom slope of 1V:12H) fitted with standard sludge removal equipment is to handle 3.6 MLD of water? If the detention period of the tank is 5 hours and the depth of the tank is 3m, what should be the diameter of the tank?	K4	2	7M
			Unit-III			
3	a		i) Explain variation in flow of sewage? And explain average flow, dry weather flow, and maximum flow.	K3	3	7M
			ii) A 30 cm dia sewer with an invert slope of 1 in 400 is flowing $1/3^{rd}$ of the full depth. Calculate the velocity and the rate of flow in the sewer. Is the self-cleaning velocity? Use n=0.015	K4	3	7M
			OR			
	b		i) Explain the importance of determination of solids in sewage. How do you determine the suspended solids in a given sample of waste?	K3	3	7M
			ii) The 3-day 37^0C BOD of a sample of sewage is 300 ppm. What will be its 10 days —20^0 C BOD and 5-day 30^0C BOD?	K3	3	7M
4			**Unit-IV**			
	a		i) Discuss the process of secondary treatment or biological treatment of wastewater? Enumerate various treatment techniques used for biological treatment.	K3	4	7M
			ii) A sedimentation tank treats 8 mLd containing 240 mg/l of suspended solids. The tank removes 65% of the suspended solids. Compute the weight and volume of the sludge produced yearly if the moisture content is (i) 97% (ii) 94%	K4	4	7M

		OR			
	b	i) Explain the septic tank with a neat sketch and design the septic tank for a colony having 1400 persons and assume the suitable data	K4	4	14M
5		Unit-V			
	a	i) Differentiate between aerobic and anaerobic treatment of sewage, giving major end products. List the treatment method in each category.	K3	5	7M
		ii) Explain the concept of a digestion of sludge? Differentiate between anaerobic and aerobic digestion. Explain the mechanism of anaerobic digestion.	K3	5	7M
		OR			
	b	i) Explain the sludge conditioning. Why elutriation is necessary before chemical conditioning?	K3	5	7M
		ii)Design an oxidation pond for treating sewage for a town of 20,000 persons. Sewage flow =200 mb/l BOD of raw sewage =300kg/hectare/day Organic loading rate = 300kg/hectare/day Depth of pond = 1.2m	K4	5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CE3203   **HYDROLOGY AND IRRIGATION ENGINEERING**

Time: 3 hours   (CE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Discuss the various processes involved in 'Hydrologic cycle' using Horton's Engineering representation.	2	1	10M
		ii) Rainfall of intensity 25 mm/h occurred over a watershed of 100 ha for an 8 hrs. The measured direct runoff volume in the stream draining the watershed was 40,000 m^3. Calculate the precipitation not available to runoff.	4	3	4M
		OR			
	b	i) Explain the importance of hydrology.	2	1	7M
		ii) Describe depth-area-duration (DAD) and Intensity-duration frequency (IDF) curve.	2	2	7M
		Unit-II			
2	a	i) What methods estimate evaporation losses from surfaces and large water bodies? Discuss anyone approach suitably.	1	3	10M
		ii) Explain with a neat sketch double ring infiltrometer.	2	3	4M
		OR			
	b	i) Explain what is evapo-transpiration and factors affecting it.	1	3	10M
		ii) Discuss the factors that affect infiltration.	2	3	4M
		Unit-III			
3	a	i) What is runoff? List and explain factors affecting it.	2	4	6M
		ii) Given the ordinates of a 4-hour unit hydrograph. Derive the ordinates of 12-hour unit hydrograph for the same catchment. What is the peak value of discharge and the corresponding time interval observed in 4-h and 12-h unit hydrograph.	3	4	8M
		OR			
	b	i) Define the following: (1) Basin recharge (2) Direct runoff (3) Drainage density.	2	4	6M
		ii) Rainfall of magnitude 3.8 cm and 2.8 cm occur on two consecutives 4h durations on a catchment of area 27 km^2 produced the following hydrograph of flow at the outlet of the catchment. Find the rainfall excess and Phi ( ) index.	3	4	8M
		Unit-IV			
4	a	i) Develop the equation relating the steady-state discharge from a well in an unconfined aquifer and depths of water table at two known positions from the well. State clearly all the assumptions involved in your derivation.	2	5	8M
		ii) A 30 cm well completely penetrates an unconfined aquifer of saturated	4	5	6M

Table for Q.3 a) ii):

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinates of 4-h UH cm³/s	0	20	80	130	150	130	90	52	27	15	05	0

Table for Q.3 b) ii):

Time (h)	-6	0	6	12	18	24	30	36	42	48	54	60	66
Flow (cumecs)	6	5	13	26	21	16	12	9	7	5	5	4	4

			KL	CO	M
		depth 40 m. After a long period of pumping at a steady rate of 1500 lpm, the drawdown in two observation wells 25 and 75 m from the pumping well were found to be 3.5 m and 2.0 m respectively. Determine the transmissibility of the aquifer. What is the drawdown at the pumping well?			
		OR			
	b	i) Describe the recovery test to estimate the transmissibility of a confined aquifer.	2	5	6M
		ii) A 30 cm well completely penetrates an artesian aquifer. The length of the strainer is 25 m. Determine the discharge from the well when the drawdown at the pumping well is 4.0 m. The coefficient of permeability of the aquifer is 45 m/day. Assume the radius of influence of the well as 350 m.	3	5	8M
5		Unit-V			
	a	i) Define Duty and Delta. Derive the relation between them.Also write consumption use of water	3	1	14M
		OR			
	b	i) Distinguish between the following: (1) Crop ratio and crop rotation. (2) Water conveyance and water distribution efficiency.	2	1	7M
		ii) A kharif crop having a duty of 2500 ha/cumecs and the delta for the crop is 0.425 m. Find the base period of the crop.	3	1	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CE3204 **FOUNDATION ENGINEERING**

Time: 3 hours (CE) Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	CO	KL	M
			Unit-I			
1	a		i) What is need for soil exploration? Explain briefly different field methods.	CO1	K2	7M
			ii) Explain briefly about bore log. How to prepare the soil investigation report according with the soil profile and explain it with neat sketch?	CO1	K2	7M
			OR			
	b		i) Explain different types of borings with advantages and disadvantages	CO1	K2	7M
			ii) Explain the procedure of pressure meter test with neat sketch	CO1	K3	7M
			Unit-II			
2	a		i) How a slope is analysed using Swedish circle method? Derive expression for the Factor of safety.	CO3	K2	7M
			ii) A cut 10m deep is to be made in a stratum of cohesive soil c=35 kN/m², γ = 21 kN/m³ and Φ = 0. The bed rock is located 1.5m below the original ground surface. Determine the factor of safety against failure if the slope is 30°, the stability number is equal to 0.164	CO3	K2	7M
			OR			
	b		i) What are the assumptions made in Coulomb's theory? Compare Rankine's theory and Coulomb's theory.	CO3	K2	7M
			ii) A retaining wall is 7m heigh, with its back face smooth and vertical. It retains sand with its surface horizontal. Using Rankine's theory, determine active earth pressure at the base when backfill is (a)dry, (b) saturated, (c) submerged, with water table at surface. Take γ = 18 kN/m³ and Φ = 30° and γ_{sat} = 21 kN/m³ .	CO3	K2	7M
			Unit-III			
3	a		i) Explain different types of shallow foundations and what are the factors to be considered in their location?	CO3	K2	7M
			ii) A circular footing is of 2.4m diameter. If the depth of foundation is 1m, determine the net allowable load. Take γ = 19 kN/m³ ,C = 30 kN/m², ϕ'=15° and FOS=3. Use Terzaghi's equation and assume local shear failure.	CO3	K2	7M
			OR			
	b		i)Differentiate between general shear failure and local shear failure. How ultimate bearing capacity in general shear failure determined?	CO3	K2	7M
			ii) A footing 2m square is laid at a depth of 1.3m below the ground surface. Take γ = 20 kN/m³ ,C = 0,Φ' = 30°. Determine the net ultimate bearing capacity using IS Code method if a) Water table rise to level of base b) Water table is 1m below the base	CO3	K3	7M
			Unit-IV			
4	a		i.) What is settlement? Explain the uniform and Differential settlements of foundations with neat sketches?	CO2	K3	7M
			ii) A 2 m x 4 m flexible foundation is placed on a granular soil with D_f = 5. The foundation applies a pressure q_{o} =120 kN/m². Assuming the soil mass to be infinitely thick, with E_s=15 MN/m² and μ_s=0.1, determine the expected settlement beneath the center of the foundation.	CO2	K2	7M

				KL		M
		OR				
	b	i) Write down the procedure for finding ultimate settlement from load settlement curve in plate load test and also write limitations of plate load test.	CO2	K3		7M
		ii) A plate load test was conducted in sand on a 300 mm diameter plate. If the plate settlement was 5 mm at a pressure of 100 kPa, the settlement (in mm) of a 5m x 8m rectangular footing at the same pressure will be	CO2	K2		7M
5		Unit-V				
	a	i) What are the different types of piles? What is negative skin friction and what is its effect on the pile?	CO4	K2		7M
		ii) A concrete pile, 30cm diameter, is driven into a medium dense sand $\Phi=35°$, $\gamma = 21$ kN/m³, K=1.0, tan $\delta=0.70$ for a depth of 8m. Estimate the safe load, take factor of safety of 2.50	CO4	K2		7M
		OR				
	b	i) What is well foundation? Explain the various components in well foundations with neat sketches?	CO4	K3		7M
		ii) Explain in detail about Tilt and shift in well foundation.	CO4	K2		7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC2OE01　　　**REMOTE SENSING AND GIS**

Time: 3 hours　　　　　　　　　(CE)　　　　　　　Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks　(5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Briefly explain about Geo Synchronous satellites and Passive Remote Sensing.	K2	1	7M
			ii) Discuss the electromagnetic spectrum. And explain with a neat sketch.	K3	1	7M
			OR			
	b		i) Explain the importance of satellites and their sensors.	K2	1	7M
			ii) Explain in detail about the concept of resolution and discuss in detail spatial and radiometric resolutions.	K3	1	7M
			Unit-II			
2	a		i) Describe the importance of image classification in Remote Sensing.	K2	2	7M
			ii) Briefly explain the categories of image classifications used and distinguished among each other.	K3	2	7M
			OR			
	b		i) Explain the importance of overlaying index methods in GIS.	K2	2	7M
			ii) Discuss the network analysis. Explain its uses.	K3	2	7M
			Unit-III			
3	a		i) Mention the specific resolution needs in flood zone mapping and discuss the methodology used in such studies.	K2	3	7M
			ii) Explain GIS layers developed for watershed characterization.	K3	3	7M
			OR			
	b		i) Explain briefly the vector overlay operation.	K2	3	7M
			ii) Explain the conditional expressions in spatial analysis.	K3	3	7M
			Unit-IV			
4	a		i) Explain the different raster data structures.	K2	4	7M
			ii) Define raster data model? Explain the different types of raster data used in GIS.	K3	4	7M
			OR			
	b		i) Explain vector data model? How to represent the simple spatial features in vector data model.	K2	4	7M
			ii) Explain the concept of coverage. Mention their importance.	K3	4	7M
			Unit-V			
5	a		i)) Explain topological model of vector data.	K3	5	7M
			ii) Describe spaghetti, vertex dictionary and DIME.	K3	5	7M
			OR			
	b		i) Explain the applications of RS and GIS in natural resource management.	K3	5	7M
			ii) Explain the following: Urban planning, traffic management.	K3	5	7M

KL: Blooms Taxonomy Knowledge Level　CO: Course Outcome　　M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EE3201 **MICROPROCESSOR AND MICRO CONTROLLERS**

(EEE)   Max. Marks: 70

Time: 3 hours

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain the role of following in microprocessor: Accumulator, ALE, Ready Signal and Program Counter.	K1	CO1	8M
		ii) Name the four segments of memory with which 8086 microprocessor work at a time. Also, explain how 8086 microprocessor access a particular location within the selected segment.	K2	CO2	6M
		OR			
	b	i) List out the salient features of 80386 and 80486 processors	K2	CO1	6M
		ii) Draw the flag register of 8086 microprocessor and explain the function of each flag.	K1	CO1	8M
		Unit-II			
2	a	i) Explain the following addressing modes with suitable examples: Direct addressing mode, Register indirect addressing mode, Immediate addressing mode, Indirect addressing mode.	K3	CO2	8M
		ii) Draw the timing diagrams of minimum mode write operation and explain in detail.	K3	CO2	6M
		OR			
	b	i) Explain the data transfer instructions with examples.	K2	CO2	7M
		ii) With a neat sketch describe the Minimum and Maximum mode of operation of 8086.	K3	CO2	7M
		Unit-III			
3	a	i) Write an Assemble language program to find the sum of squares of first ten numbers.	K3	CO3	7M
		ii) Explain the following Instructions: i. MOVX, ii. CJNE A, add, radd, iii. ADDC, iv. JMP@A+DPTR	K2	CO5	7M
		OR			
	b	i) Explain in detail about the Stack Structure of 8086. Write a sample program to illustrate the concept of programming the stack.	K4	CO3	7M
		ii) Write an Assemble language program to find number of even and odd numbers in an 8- Bit array.	K3	CO3	7M
		Unit-IV			
4	a	i) Differentiate between BSR and I/O modes of 8255 PPI.	K3	CO4	7M
		ii) Explain the interfacing procedure of an 8-bit ADC with 8086 microprocessor.	K4	CO4	7M
		OR			
	b	i) Explain Programming model of 8259.	K3	CO4	7M
		ii Explain Modes of operation and Command words of 8279.	K3	CO4	7M
		Unit-V			
5	a	i) Explain the memory map of the internal RAM and special function registers of the 8051 microcontroller.	K2	CO5	7M
		ii) Explain TMOD and TCON control words of 8051 microcontroller.	K2	CO5	7M
		OR			
	b	i) Discuss the uses of pins of port 3 of the 8051 microcontroller.	K4	CO5	6M
		ii) Name the interrupt sources 0f 8051 microcontroller and specify their respective vector addresses and priority levels after reset. Also, explain how the interrupts can be enabled or disabled.	K4	CO5	8M

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EE3202　　　**POWER SYSTEM ANALYSIS**
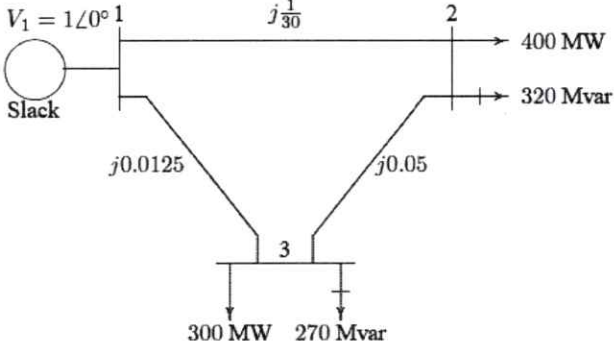
Time: 3 hours　　　　　　　　　　(EEE)　　　　　　　　Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks　(5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) What are the advantages of per unit system	1	1	7M
			ii) A 40 MVA, 20 / 400 kV single phase transformer has the following impedances. $Z_p = 0.9 + j1.8$ ohms and $Z_s = 128 + j288$ ohms Find: i. p.u impedance of the transformer referred to HV ii. p.u impedance of the transformer referred to LV.	2	1	7M
			OR			
	b		i) Define the following terms with suitable examples i. Tree　　　ii. Branches　　　iii. Links iv. Co-tree　　v. Basic loop　　vi. Path	1	1	6M
			ii) Explain how do you form Y_{bus} by direct inspection with suitable example?	2	1	8M
			Unit-II			
2	a		Figure shows the one-line diagram of a simple three-bus power system with generation at bus 1. The voltage at bus 1 is $V_1 = 1 \angle 0^0$ per unit. The scheduled loads on buses 2 and 3 are marked on the diagram. Line impedances are marked in per unit on a 100 MVA base. For the purpose of hand calculations, line resistances and line charging susceptances are neglected. Using Gauss-Seidel method and initial estimates of $V_2^{(0)} = 1.0 + j0$ and $V_3^{(0)} = 1.0 + j0$, determine V_2 and V_3.	4	2	14M
			OR			
	b		i) Explain step by step algorithm of N-R (Polar form) algorithm including P-V buses.	2	2	7M
			ii) How do you classify the buses in power system and what is its necessity	1	2	7M
3			Unit-III			
	a		i) What is symmetrical components? Explain the symmetrical component transformation	2	4	7M
			ii) The line currents in a 3 phase supply to an un balanced load are respectively Ia = 10 + j20; Ib = 12 - j10; Ic = -3 - j5 Amp. phase sequence is abc. Determine the sequence components of currents.	3	4	7M
			OR			
	b		i) What are the causes and effects of short circuits?	2	3	7M

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			KL	CO	M
		ii) Consider the system as shown in Figure. The percentage reactance of each alternator is expressed on its own capacity, determine the short circuit current that will flow into a three-phase short circuit at F.	3	4	7M

		Unit-IV			
4	a	i)Derive an expression for the fault current for a line-to-ground fault at an unloaded generator	2	4	7M
		ii) A 50 MVA, 11 kV, 3 phase alternator was subjected to different types of faults. The magnitude of the fault currents are as below Three phase fault: 1870 A, Line to line fault: 2590 A Single line to ground fault: 4130 A. The neutral of the alternator is solidly grounded. Calculate the negative sequence reactance of the alternator	3	4	7M
		OR			
	b	i) Derive an expression for the fault current for a LLG fault at an unloaded generator	2	4	7M
		ii) For the system shown in figure. A LLG fault occurs at point F. Find fault current	3	4	7M

		Unit-V			
5	a	i) Derive the swing equation of a synchronous machine swinging against an infinite bus. Clearly state the assumptions in deducing the swing equation.	2	5	7M
		ii) Two turbo alternators with ratings given below are connected via a short line. Machine 1: 4 pole, 50 Hz, 60 MW, 0.8 p.f lag, moment of inertia 30, 000 kg-m^2 Machine 2: 2 pole, 50 Hz, 80 MW, 0.85 p.f lag, moment of inertia 10,000 kg-m^2. Calculate the inertia constant of single equivalent machine on a base of 200MVA	3	5	7M
		OR			
	b	i) What is equal area criterion? Interpret this for a case when there is a sudden short circuit at one end of one of the line of parallel lines.	2	5	7M
		ii) A generator is delivering 0.6 of maximum power to an infinite bus through a transmission line. A fault occurs such that the reactance between the generator and the infinite bus is increased to 3 times its pre-fault value. When the fault is cleared, the maximum power that can be delivered is 0.8 of the original maximum value. Calculate the critical clearing angle.	3	5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EE3203   MEASUREMENTS AND INSTRUMENTATION

Time: 3 hours   (EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) What are the static characteristics of measuring systems? Define them.	K1	CO1	7M
			ii) Explain the construction and working of PMMC instrument and also state the advantages, disadvantages and errors in PMMC instrument?	K1	CO1	7M
			OR			
	b		i) Explain different types of errors that may occur in measurement.	K4	CO3	7M
			ii) Describe the different methods of producing controlling torque in an analog indicating instrument. list its advantages and disadvantages.	K4	CO3	7M
			Unit-II			
2	a		Explain the construction and operation of single phase induction type energy meter? And derive torque equation?	K4	CO3	14M
			OR			
	b		Describe the constructional details and working of a single phase electrodynamometer type of power factor meter. Prove that displacement of moving system is equal to the phase angle of the system?	K4	CO3	14M
			Unit-III			
3	a		Explain the term standardization of a potentiometer. Describe the procedure of standardization of a D.C potentiometer	K4	CO3	14M
			OR			
	b		Describe the working of Maxwell's inductance capacitance bridge for measurement of unknown inductance and derive the expression for its balance condition. Draw its phasor diagram.		CO3	14M
			Unit-IV			
4	a		i) Explain the operation of a CRO with a neat diagram.	K2	CO4	7M
			ii)what are the factors that affects the brightness of the display of a CRT.	K2	CO4	7M
			OR			
	b		i) Explain the theory working of an LED. Describe the advantages of LEDs.	K2	CO4	7M
			ii) Describe the basic components of magnetic tape recorder used for instrument applications. Explain its advantages and disadvantages	K2	CO4	7M
5			Unit-V			
	a		i) Describe the construction, principle of working and applications of hall effect transducers.	K3	CO5	7M
			ii) Describe the different modes of operation of piezoelectric transducers. Explain properties and applications of piezoelectric transducers.	K3	CO5	7M
			OR			
	b		i) Discuss different criteria for selection of transducers for a particular application	K3	CO5	7M
			ii) Explain the different principles of working of capacitive transducers.	K3	CO5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks***

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EE3205   **ELECTRIC DRIVES**

Time: 3 hours   (EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Explain regenerative braking and dynamic braking.	K2	1	7M
			ii) A constant speed drive has the following duty cycle: • Load rising from 0 to 400KW: 5 minute • Uniform load of 500KW: 5 minute • Regenerative power of 400KW returned to the supply : 4 minute • Remains idle: 2 minute Estimate power rating of the motor. Assume losses to be proportional to $(power)^2$.	K3	1	7M
			OR			
	b		i) The motor rating is to be selected from a class of motors with heating and cooling time constants of 60 and 90 minutes respectably. Calculate the motor rating for the following duty cycles: • Short-time periodic duty cycle consisting of 10KW load for 10 minutes followed by no load period long enough for motor to cool down. • Intermittent periodic duty cycle consisting of 100KW load period of 10 minutes. Assume losses to be proportional to $(power)^2$.	K3	1	7M
			ii) Explain the load-torque characteristics of electric drive.	K3	1	7M
2			**Unit-II**			
	a		i) A dc separately excited motor is running at 800 rpm driving a load whose torque is constant. Motor armature current is 500A. The armature resistance drop and rotational losses are negligible. Magnetic circuit can be assumed to be linear. Calculate motor speed and armature current if terminal voltage is reduced to 50% and field current is reduced to 80%.	K3	2	7M
			ii) Explain the working of a dc series motor and explain why it is more suitable to deal with torque over loads than other dc motors.	K3	2	7M
			OR			
	b		i) Explain the principle of operation of dual converters and dual converter fed DC motor drives.	K3	2	7M

			KL	CO	M
		ii) Draw the Speed-Torque characteristics for a single phase fully controlled converter fed self-excited dc motor.	K3	2	7M
		Unit-III			
3	a	i) Discuss the different control techniques of chopper in detail.	K2	3	7M
		ii) Explain the continuous operation of a two quadrant chopper fed separately excited dc motor.	K3	3	7M
		OR			
	b	i) Explain about the closed loop operation of chopper control drives. Also explains its merits and demerits	K3	3	14M
		Unit-IV			
4	a	i) Explain variable frequency control of induction motor by PWM voltage source inverter with necessary block diagram.	K3	4	7M
		ii) Describe the working of Static Kramer drive in detail.	K4	4	7M
		OR			
	b	i) Explain the closed loop voltage/frequency control scheme of induction motor drives.	K3	4	7M
		ii) Explain the Speed-Torque characteristics of 3-phase induction motor.	K3	4	7M
		Unit-V			
5	a	i) Explain the load commutated Synchronous motor with necessary block diagram.	K3	5	7M
		ii) Summarize the self-control technique of synchronous motor in detail with the operation rotor position encoder.	K2	5	7M
		OR			
	b	i) Differentiate between Closed loop and Open loop operation of Synchronous motor drive.	K2	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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2

III B.Tech II Semester Regular Examinations, April-2024

R20

Sub Code: R20CC2OE03 **HYBRID ELECTRIC VEHICLES**

Time: 3 hours (EEE) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
.1	a	i)	Draw the layout diagram and explain the power transmission path in electric vehicles?	4	1	7M
		ii)	Describe the design aspects of propulsion system of electric vehicles with necessary equations?	4	1	7M
			OR			
	b	i)	Draw the layout diagram and explain the power transmission path in hybrid electric vehicles?	4	1	7M
		ii)	Explain in detail about the dynamics of vehicle motion in electric vehicles with relevant diagrams?	4	1	7M
			Unit-II			
2	a	i)	Draw the characteristics and explain the states of charge and discharges of batteries used in electric vehicles?	3	2	7M
		ii)	Describe the pack energy calculations of battery with necessary equations?	3	2	7M
			OR			
	b	i)	Discuss in detail about the types and properties of batteries used in electric vehicles?	3	2	7M
		ii)	Describe the criterion and calculation of number of cells required for a battery with specifications?	3	2	7M
			Unit-III			
3	a	i)	Discuss in detail about the ratings of motors and engines used in electric vehicles with specifications?	3	3	7M
		ii)	Draw necessary characteristics and explain the switched reluctance motor used in the electric vehicle operation?	3	3	7M
			OR			
	b	i)	Elaborate the desired characteristic features of electric machines used in electric vehicles?	3	3	7M
		ii)	Draw necessary characteristics and explain the induction machines used in the electric vehicle operation?	3	3	7M
			Unit-IV			
4	a	i)	Derive and analyze the typical front wheel drive mechanics of electric vehicle driven train?	4	4	7M
		ii)	Describe the regenerative braking in electric vehicle driven train with advantages?	4	4	7M
			OR			
	b	i)	Derive and analyze the typical front wheel drive mechanics of electric vehicle driven train?	4	4	7M
		ii)	Elaborate the motor sizing criterion in electric vehicle driven train with relevant relations?	4	4	7M

			Unit-V			
5	a	i)	Discuss in detail about advantages, disadvantages and applications of hybrid electric vehicles?	4	5	7M
		ii)	Explain in detail about drive train functioning with relevant to hybrid electric vehicles?	4	5	7M
			OR			
	b	i)	Discuss in detail about the scenario of hybrid electric vehicles in the market?	4	5	7M
		ii)	Elaborate the sizing of components of hybrid electric vehicles?	4	5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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2

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20ME3201   **DESIGN OF MACHINE ELEMENTS-II**

Time: 3 hours   (ME)   **Max. Marks: 70**

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		**Solve** the following problem. The following data is given for a 3600 hydrodynamic bearing: radial load = 3.6 kN Journal diameter = 55 mm, bearing length =27.5 mm, radial clearance = 0.05 mm, viscosity of lubricant = 25 Cp, if the sommerfield number for the bearing is 0.0923, determine. i) Journal speed ii) Coefficient of friction iii) Power lost in friction iv) Flow requirement v) Temperature rise.	K3	CO1	14M
			OR			
	b		**Solve** the following problem. A ball bearing with a dynamic load capacity of 22.8 KN is subjected to a radial load of 10KN. Calculate i) The expected life in millon revolutions that 90% of the bearings will reach ii) The corresponding life in hours, if the shaft is rotating at 1450rpm; and iii) The life that 50% of the bearings will complete or exceed before fatigue failure	K3	CO1	14M
			Unit-II			
2	a		**Solve** the following problem. Determine the dimensions of cross-section of the connecting rod for a diesel engine with the following data: Cylinder bore = 100mm Length of connecting rod = 350mm Maximum gas pressure = 4 MPa Factor of safety = 6	K3	CO2	14M
			OR			
	b	i)	Explain the function of a connecting rod of an internal combustion engine?	K2	CO2	4M
		ii)	Discuss the design procedure for Crankshaft of an IC engine.	K5	CO2	10M
3			**Unit-III**			
	a		**Solve** the following problem. The bore of a cylinder of the four stroke diesel engine is 120 mm. The maximum gas pressure inside the cylinder is limited to 4 MPa. The cylinder head is made of cast iron and allowable tensile stress is 40 N/mm2 . Determine the thickness of the cylinder head, the studs, made of steel have allowable stress of 50 N/mm2 . Calculate. a) number of studs b) nominal diameter of studs c) pitch of studs	K3	CO3	14M
			OR			
	b		**Solve** the following problem. The cylinder of a four-stroke diesel engine has the following specifications: Cylinder bore = 150mm Maximum gas pressure = 3.5MPa Cylinder material = grey cast iron FG 200 (Sut =200N/mm²) Factor of safety = 5 Poisson's ratio = 0.25 Determine the thickness of the cylinder wall , Also , calculate the apparent and net circumferential and longitudinal stresses in the cylinder wall	K3	CO3	14M
4			**Unit-IV**			
	a		**Solve** the following problem. A curved beam circular in plan, 5 m radius and supported on three equally spaced supports. The beam carries a uniformly distributed load of 20 kN/m of the circular length. Analyse the beam and calculate maximum stress in the beam.	K3	CO4	14M

		OR			
	b	**Solve** the following problem. The crane hook carries a load of 20 kN as shown in given below Fig.1 The section at X-X is rectangular whose horizontal side is 100 mm. Find the stresses in the inner and outer fibres, the given section. **Fig.1**	K3	CO4	14M
		Unit-V			
5	a	**Solve** the following problem. The following data is given for an open-type V-belt drive Diameter of driving pulley = 150mm Diameter of driven pulley = 300mm Centre distance = 1m Groove angle = 40° Mass of belt = 0.25kg/m Maximum permissible tension = 750N Coefficient of friction = 0.2. Calculate the maximum power transmitted by the belt and the corresponding belt velocity Neglect power losses and calculate angle of contact by the belt.	K3	CO5	14M
		OR			
	b	**Solve** the following problem. It is required to design a chain drive to connect a 12KW, 1400rpm electric motor to a centrifugal pump running at 700rpm. The service conditions involve moderate shocks. i) Select a proper roller chain and give a list of its dimensions ii) Determine the pitch circle diameter of driving and driven sprockets iii) Determine the number of chain links iv) Specific the correct centre distance between the axes of sprockets	K3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20ME3202 **HEAT TRANSFER**

Time: 3 hours (ME) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No				KL	CO	M
			Unit-I			
1	a		i) What is steady-state heat conduction? Derive the general conduction equation in Cartesian coordinates.	K5	1	7M
			ii) A composite wall consists of two layers: a 0.2 m thick layer of brick with a thermal conductivity of 0.8 W/m-K and a 0.3 m thick layer of concrete with a thermal conductivity of 1.5 W/m-K. The inside surface of the bricklayer is exposed to a temperature of 100 °C and the outside surface of the concrete layer is exposed to a temperature of 20 °C. Calculate the heat transfer rate through the wall.	K5	1	7M
			OR			
	b		i) A pipe with a diameter of 20 cm carries hot water at a temperature of 80 °C. The pipe is insulated with a layer of insulation that has a thermal conductivity of 0.1 W/m-K. The convective heat transfer coefficient on the outside surface of the insulation is 20 W/m²K. Calculate the critical insulation thickness.	K5	1	7M
			ii) What is the critical insulation thickness? Derive an expression for the critical insulation thickness.	K5	1	7M
			Unit-II			
2	a		i) What are the different types of fin boundary conditions? How do they affect the fin efficiency?	K5	2	7M
			ii) A straight fin is attached to a plane wall. The fin has a specified temperature of 20 °C at the tip. The fin is exposed to a temperature of 100 °C on the outside. The fin has a length of 0.5 m and a cross-sectional area of 0.001 m². The thermal conductivity of the fin is 100 W/m-K. Calculate the heat transfer rate from the fin and the fin efficiency.	K5	2	7M
			OR			
	b		i) What are fins? What are the different types of fins? Explain the applications of fins.	K5	2	7M
			ii) A plane wall is 1 m long and 0.2 m wide. It is exposed to a temperature of 100 °C on one side and 20 °C on the other side. The wall has a thermal conductivity of 20 W/m-K. A fin is attached to the wall on the side that is exposed to the 100 °C temperature. The fin has a length of 0.5 m and a cross-sectional area of 0.001 m². The thermal conductivity of the fin is 100 W/m-K. Calculate the heat transfer rate through the wall with and without the fin.	K5	2	7M
3			**Unit-III**			
	a		i) What is forced convection? What are the different types of forced convection? What is the effect of free-stream turbulence on the convective heat transfer coefficient?	K3	3	7M
			ii) A cylinder is exposed to a fluid flowing at a velocity of 2 m/s. The fluid has a temperature of 20 °C and the cylinder has a temperature of 100 °C. The cylinder is 0.5 m long and has a diameter of 0.2 m. The thermal conductivity of the fluid is 0.1 W/m-K. Calculate the heat transfer rate from the cylinder to the fluid.	K4	3	7M

		OR			
	b	i) What are the different methods for increasing the convective heat transfer coefficient? What is the effect of finning on the convective heat transfer coefficient?	K3	3	7M
		ii) Air flows through a rectangular duct at a velocity of 1 m/s. The air has a temperature of 20 °C and the duct has a temperature of 100 °C. The duct has a width of 0.5 m and a height of 0.2 m. The thermal conductivity of air is 0.024 W/m-K. Calculate the heat transfer rate from the duct to the air.	K5	3	7M
4		Unit-IV			
	a	Explain buckinghom Pi theorm of derivation of non dimensional numbers	K4	4	14 M
		OR			
	b	i) Define LMTD method of design of heat exchangers	K5	4	7M
		ii) Explain NTU method of design of heat excahngers	K5	4	7M
5		Unit-V			
	a	i) Explain the different regimes of pool boiling and discuss the factors that affect the transition from one regime to another.	K3	5	7M
		ii) A counter-flow heat exchanger is used to heat oil from 20 °C to 80 °C using steam at 100 °C. The oil flow rate is 200 kg/hr and the steam flow rate is 100 kg/hr. The overall heat transfer coefficient of the heat exchanger is 150 W/m²-K. Calculate the required surface area of the heat exchanger.	K5	4	7M
		OR			
	b	i) A black body has a temperature of 1000 K. Calculate the following: i. Total black body emissive power ii. Wavelength at which the black body emissive power is a maximum. iii. Spectral emissive power at a wavelength of 1 μm.	K4	5	7M
		ii) What is the black body radiation? What are the different laws of black body radiation?	K4	5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024
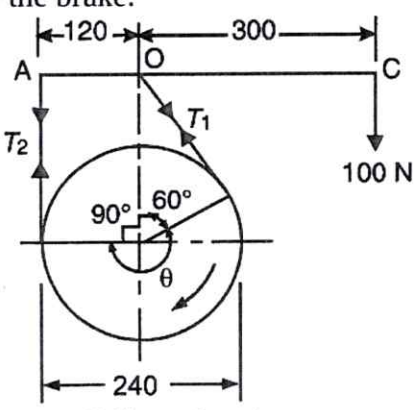
Sub Code: R20ME3203 **DYNAMICS OF MACHINERY**

Time: 3 hours (ME) Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a	i)	What do you understand by gyroscopic couple? Derive a formula for its magnitude.	K3	CO1	7M
		ii)	An aeroplane makes a complete half circle of 50 m radius, towards left, when flying at 200 km per hr. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 rpm, clockwise when viewed from the near. Find the gyroscopic couple on the aircraft and state its effect on it.	K4	CO1	7M
			OR			
	b	i)	Discuss the effect of the gyroscopic couple on a two wheeled vehicles.	K3	CO1	7M
		ii)	Each paddle wheel of a steamer have a mass of 1600 kg and a radius of gyration of 1.2 m. The steamer turns to port in a circle of 160 m radius at 24 km/h, the speed of the paddles being 90 rpm. Find the magnitude and effect of the gyroscopic couple acting on the steamer.	K4	CO1	7M
			Unit-II			
2	a	i)	Describe with a neat sketch the working of a single plate friction clutch.	K3	CO2	10M
		ii)	A single plate clutch, with both sides effective, has outer and inner diameters 300 mm and 200 mm respectively. The maximum intensity of pressure at any point in the contact surface is not to exceed $0.1\ N/mm^2$. If the coefficient of friction is 0.3, determine the power transmitted by a clutch at a speed 2500 rpm.	K4	CO2	4M
			OR			
	b	i)	Classify the brakes and explain in brief any one type of brake with neat sketch.	K2	CO2	7M
		ii)	The simple band brake, as shown in *Fig.1*. is applied to a shaft carrying a flywheel of mass 400 kg. The radius of gyration of the flywheel is 450 mm and runs at 300 rpm. If the coefficient of friction is 0.2 and the brake drum diameter is 240 mm, find : 1. the torque applied due to a hand load of 100 N, 2. the number of turns of the wheel before it is brought to rest, and 3. the time required to bring it to rest, from the moment of the application of the brake. All dimensions in mm. *Fig.1.*	K4	CO2	7M

				KL	CO	M
			Unit-III			
3	a	i)	Explain the working of a Watt governor with suitable sketch.	K2	CO3	7M
		ii)	Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor.	K4	CO3	7M
			OR			
	b	i)	Differences between flywheel and governor.	K2	CO3	7M
		ii)	Explain about the turning moment diagrams.	K3	CO3	7M
			Unit-IV			
4	a	i)	Four masses m_1, m_2, m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m	K4	CO4	7M
		ii)	Explain about the balancing of several masses rotating in different planes	K3	CO4	7M
			OR			
	b		A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	K4	CO4	14M
			Unit-V			
5	a	i)	A single cylinder reciprocating engine has speed 240 rpm, stroke 300 mm, mass of reciprocating parts 50 kg, mass of revolving parts at 150 mm radius 37 kg. If two third of the reciprocating parts and all the revolving parts are to be balanced, find : 1. The balance mass required at a radius of 400 mm, and 2. The residual unbalanced force when the crank has rotated 60° from top dead centre.	K4	CO5	4M
		ii)	Analyze about the primary and secondary unbalanced forces in reciprocating masses	K3	CO5	10M
			OR			
	b		A four cylinder vertical engine has cranks 150 mm long. The planes of rotation of the first, second and fourth cranks are 400 mm, 200 mm and 200 mm respectively from the third crank and their reciprocating masses are 50 kg, 60 kg and 50 kg respectively. Find the mass of the reciprocating parts for the third cylinder and the relative angular positions of the cranks in order that the engine may be in complete primary balance.	K4	CO5	14M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20ME3207   **ROBOTICS AND APPLICATIONS**

Time: 3 hours   (ME)   Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
1			**Unit-I**			
	a		i) Discuss the anatomy of Robot and explain the important parts of a robot with a neat sketch	K2	CO 1	7M
			ii) Sketch the following robots indicating the joints and degree of freedom of SCARA robot and Gantry robot. Write their applications	K3	CO 1	7M
			OR			
	b		i) Compute the homogeneous transformation representing a translation of 3 units along the x-axis and followed by rotation of 90^0 about the current z-axis followed by a translation of 1 unit along the fixed y-axis	K3	CO 1	7M
			ii) Determine the revolution matrix for a rotation of 45^0 about y-axis followed by a rotation of 120^0 about z-axis, and a final rotation of 90^0 about x-axis.	K3	CO 1	7M
2			**Unit-II**			
	a		i) Discuss the performance characteristics of actuators. Compare electrical, pneumatic & hydraulic actuators for their characteristics	K3	CO 2	7M
			ii) Compare stepper motor and D.C. motor drives for a robot	K3	CO 2	7M
			OR			
	b		i) Briefly explain the working principle of Range sensors with neat sketch	K2	CO 2	7M
			ii) With neat sketches, explain velocity sensors used in Robots.	K2	CO 2	7M
3			**Unit-III**			
	a		i) Derive the forward kinematics of the 3-DOF manipulator by considering an example	K4	CO 3	14M
			OR			
	b		Derive the position (x,y) of the given manipulator using forward kinematics approach.	K4	CO 3	14M
4			**Unit-IV**			
	a		Derive the jocobian matrix for a given figure	K4	CO 4	14M

		OR			
b	i) Determine the equations of motion for 2DOF RR- planar manipulator arm using Lagrange-Euler Formulation.	K4	CO 4	7M
	ii) For R-P-R arm manipulator, obtain Jacobian martix	K4	CO 4	7M

		Unit-V			
5	a	i) Explain application of robots in continuous arc welding	K4	CO 5	7M
		ii) Explore the desirable features of a robot for successful machine tool load/unload applications?	K4	CO 5	7M
		OR			
	b	i) Elaborate the different industrial applications of robot with examples.	K4	CO 5	7M
		ii) Explain the fundamental role of path planning in robotic systems	K3	CO 5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks***

III B.Tech II Semester Regular & Supple. Examinations, April-2024
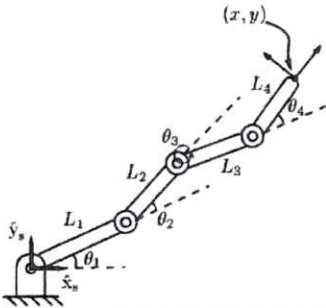
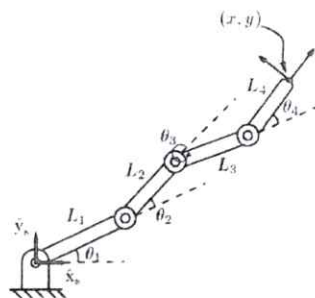**Sub Code: R20CC2OE13** **DIGITAL MARKETING**

Time: 3 hours (ME) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Write briefly about search engine marketing. Describe how it works.	K3	CO1	7M
		ii) Describe about influencer marketing. How to create an influencer marketing strategy?	K2	CO1	7M
		OR			
	b	i) Explain various types of digital marketing platforms with suitable examples	K3	CO1	7M
		ii) Compare and contrast marketing and digital marketing.	K4	CO1	7M
		Unit-II			
2	a	i) Define content marketing? How to create an effective content marketing strategy. Explain steps involved in it.	K2	CO2	7M
		ii) Explain types of mobile marketing. Mention advantages and disadvantages of mobile marketing.	K3	CO2	7M
		OR			
	b	i) Distinguish between remarketing and retargeting? How does retargeting work?	K4	CO2	7M
		ii) Discuss about different types of online advertising.	K2	CO2	7M
		Unit-III			
3	a	i) Mention the benefits of digital marketing plan? How to create an effective digital marketing plan?	K2	CO3	7M
		ii) Define Pay-Per-Click (PPC)? Explain various Pay-Per-Click models.	K2	CO3	7M
		OR			
	b	i) Define social media marketing (SMM)? Explain why social media marketing so powerful in today's era?	K2	CO3	14M
		Unit-IV			
4	a	i) Define display advertising? Develop type so display ads?	K2	CO4	7M
		ii) Differentiate between online advertising and traditional advertising.	K3	CO4	7M
		OR			
	b	i) Define keywords. Explain why keywords are important?	K2	CO4	7M
		ii) Discuss contemporary relevance of online advertising payment methods?	K2	CO4	7M
		Unit-V			
5	a	i) Devise ways to avoid common CRM pitfalls? Give examples of how a CRM platform works?	K5	CO5	7M
		ii) Define face book marketing? Explain how does it work?	K2	CO5	7M
		OR			
	b	i) Describe the process of YouTube marketing.	K3	CO5	7M
		ii) Analyze the methods to measure the effectiveness of digital media.	K4	CO5	7M

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EC3201 **MICRO WAVE AND OPTICAL COMMUNICATIONS**

(ECE)

Time: 3 hours   Max. Marks: 70

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		I) Explain the importance of microwaves in communication Engineering and Summarize different microwave spectrum & bands for different applications	K2	CO1	7M
			II) Define TE, TM and TM waves. Also Solve TE wave equation in free space.	K4	CO1	7M
			OR			
	b	i)	Analyze Why TEM wave propagation is not possible in rectangular wave guide & Explain in detail about Microwave advantages	K4	CO1	7M
		ii)	Outline Rectangular wave guide and develop the field equations of rectangular waveguides in TM mode.	K3	CO1	7M
			Unit-II			
2	a	i)	Illustrate the structure of Reflex Klystron and explain its operation using Applegate Diagram	K2	CO2	7M
		ii)	Recall the Directional coupler & Calculate the scattering matrix for Directional Coupler	K2	CO2	7M
			OR			
	b	i)	Describe the need of scattering parameters and determine the scattering matrix of E-H plane Tee junction.	K3	CO2	7M
		ii)	Explain the operation of Gyrator with a neat diagram	K2	CO2	7M
			Unit-III			
3	a		I) Evaluate RWH Theory and understand the characteristics of Gunn Diode	K4	CO3	7M
			II) Analyze how the Power measurement is performed by using Bolometer Method.	K5	CO3	7M
			OR			
	b	i)	Estimate the VSWR by using Microwave Bench.	K4	CO3	7M
		ii)	Outline the block diagram of microwave bench setup and explain each block	K2	CO3	7M
			Unit-IV			
4	a	i)	Model the optical fiber communication system with a neat block diagram	K3	CO4	7M
			II) Evaluate the Numerical aperture of step index fiber (SIF) by using Snell's law.	K4	CO4	7M
			OR			
	b	i)	Review the historical development Optical Fiber Communications and mention advantages of optical fibers	K2	CO4	7M
		ii)	Review a short note on a) Total Internal Reflection b) Acceptance angle	K2	CO4	7M
			Unit-V			
5	a	i)	Discuss on the structure of LED with a neat diagram	K2	CO5	7M
		ii)	Enumerate the concept of Link Power budget in optical communications	K3	CO5	7M
			OR			
	b	i)	Compare PIN And Avalanche Photo Diodes	K3	CO5	7M
		ii)	Reflect on the types of Noise In Photo Detectors	K2	CO5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EC3202   **VLSI DESIGN**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain about nMOS fabrication with neat sketches.	02	01	7M
		ii) Determine the Ids versus Vds Relationships with necessary expressions.	03	01	7M
		OR			
	b	i) Determine the Pull-up to Pull-down Ratio for nMOS inverter driven by another nMOS inverter.	03	01	7M
		ii) Analyze the working of CMOS Inverter with its characteristics.	04	01	7M
		Unit-II			
2	a	i) Explain about Sheet resistance and its concept applied to MOS layers with an example.	02	02	7M
		ii) Analyze the concept of Driving large capacitive loads with neat sketches.	04	02	7M
		OR			
	b	i) Explain about Wiring Capacitances in detail.	02	02	7M
		ii) Analyze the concept of Gate logic with an example.	04	02	7M
		Unit-III			
3	a	Design the Stick diagram and layout of Two input Nand gate with neat sketches.	06	03	14 M
		OR			
	b	i) Design the Stick diagram of Two input NOR Gate.	06	03	7M
		ii) Summarize about design rules used in MOS circuits.	02	03	7M
		Unit-IV			
4	a	i) Analyze the working of Ratioed logic with an example.	04	04	7M
		ii) Summarize the working of Pass Transistor Logic.	04	04	7M
		OR			
	b	i) Explain about the signal integrity issues in Dynamic CMOS design.	02	04	7M
		ii) Analyze the Speed and Power Dissipation of Dynamic CMOS logic.	04	04	7M
		Unit-V			
5	a	i) Explain about the Architecture of FPGA?	02	05	7M
		ii) Summarize about various FPGA Technologies.	02	05	7M
		OR			
	b	i) Explain about Short channel effects in detail.	02	05	7M
		ii) Summarize about FinFET Technology with neat sketches.	02	05	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EC3203   MICROPROCESSOR AND MICRO CONTROLLERS

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Define assembler and explain the different assembler directives used in 8086 microprocessor	2	1	7M
		ii) Draw the 8086 microprocessor internal architecture and explain the operation of each block.	2	1	7M
		OR			
	b	i) Draw the flag register of 8086 microprocessor and explain the function of each flag	1	1	7M
		ii)Explain the concept of instruction formats of 8086 in detail	1	1	7M
		Unit-II			
2	a	i) Draw the minimum mode pin diagram of 8086 microprocessor and explain each pin in detail	3	2	7M
		ii) Draw the timing diagrams of minimum mode read operation and explain in detail.	3	2	7M
		OR			
	b	i) Define interrupt and explain the different interrupts presented in 8086 microprocessor	1	2	7M
		ii)List out different salient features of Pentium processor in detail	1	2	7M
		Unit-III			
3	a	i) Draw the internal architecture of 8259 PIC and explain the operation of each block in detail.	2	3	7M
		ii) Draw the 8251 USART architecture and explain the operation of each block in it	2	3	7M
		OR			
	b	i) Interfacing of a two 4X4 PROM and two 8X4 RAM with 8086 CPU, draw the memory map and interfacing diagram for it, the RAM address follows the ROM address.	4	3	7M
		ii) Draw the Inter facing diagram of 8257 DMA with 8086 CPU and explain its operation	4	3	7M
		Unit-IV			
4	a	i) Draw the 8051 Microcontroller architecture and explain its operation in detail	2	4	7M
		ii) Explain the following registers (i) PCON (ii) TMOD.	2	4	7M
		OR			
	b	i) Draw the pin diagram of 8051 microcontroller and explain the function of each pin in detail	3	4	7M
		ii) Explain the differences between microprocessor and microcontroller.	3	4	7M
		Unit-V			
5	a	i)Draw the interfacing diagram of 8051 to LED's and explain its operation	5	5	7M
		ii)write short notes on Keyboard Interfacing with 8051	5	5	7M
		OR			
	B	i)Draw the circuit diagram of Interfacing Seven segment display and explain	4	5	7M
		ii) write short notes on ADC interfacing with 8051	4	5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks ***

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20EC3207   DIGITAL IMAGE PROCESSING

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a	i)	Explain Brightness adaptation and Discrimination.	KL2	1	7M
		ii)	Explain the basic Elements of digital image processing.	KL1	1	7M
			OR			
	b	i)	Write short notes on Discrete Cosine Transform (DCT)	KL3	1	7M
		ii)	Define 2D Wavelet transform and explain with mathematical equations.	KL3	1	7M
			Unit-II			
2	a	i)	Explain any three intensity transformation techniques	KL4	2	7M
		ii)	Explain how the image has been enhanced using histogram statistics method.	KL4	2	7M
			OR			
	b	i)	Explain the Homomorphic filtering with steps.	KL2	2	7M
		ii)	Write short notes on Wiener Filtering		2	7M
			Unit-III			
3	a	i)	Explain the region based segmentation techniques for color image.	KL4	3	10M
		ii)	Describe the HSI color image model.	KL2	3	4M
			OR			
	b	i)	Compress the color image having probability 0.25, 0.25 0.125, 0.12, 0.0625, 0.0625. Find average code length, entropy, efficiency and redundancy.	KL5	3	10M
		ii)	Explain the color image transformation characteristics.	KL4	3	4M
			Unit-IV			
4	a	i)	Explain Haar wavelet with mathematical equations.	KL4	4	10M
		ii)	What is use of wavelet packets?	KL2	4	4M
			OR			
	b	i)	Write a short note on lossy compression in detail.	KL2	4	7M
		ii)	What is meant by watermarking and how it enabled for image security?	KL4	4	7M
			Unit-V			
5	a	i)	Explain Hit and Miss transformation.	KL2	5	7M
		ii)	Explain morphological image Opening and closing.	KL2	5	7M
			OR			
	b	i)	Explain different edge detection techniques.	KL2	5	7M
		ii)	Illustrate Merging and splitting algorithm for image segmentation.	K2	5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC2OE10   **OOPS THROUGH JAVA**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) What is object-oriented programming and how does it differ from procedural programming?	2	1	7M
		ii) What is JDK? Explain the steps to install JDK 1.8 on windows machine.	2	1	7M
		OR			
	b	i) What are the benefits of using OOP in real-world systems and processes?	2	1	7M
		ii) Explain the role of the JVM in interpreting java code.	2	1	7M
		Unit-II			
2	a	i) Write a program to check number is even or odd using bitwise operator.	3	2	7M
		ii) Explain the role of the finalize( ) method in java with an example.	3	2	7M
		OR			
	b	i) Explain type conversion and casting with example programs.	3	2	7M
		ii) What are the benefits and drawbacks of using static variables and methods in java?	2	2	7M
		Unit-III			
3	a	i) Write a program that defines an abstract class and implements its abstract methods in a subclass.	3	3	7M
		ii) What is package? Explain how to create and use packages with an example program.	3	3	7M
		OR			
	b	i) Explain the concept of super keyword with an example.	1	3	7M
		ii) Write a java program that demonstrates how to throw and catch an exception.	3	3	7M
		Unit-IV			
4	a	i) What is thread? Explain how to create a new thread in java by inheriting the thread class?	2	4	7M
		ii) What is the difference between a high-priority thread and a low-priority thread?	2	4	7M
		OR			
	b	i) Explain about isAlive( ) and join( ) methods with example program	3	4	7M
		ii) What is Synchronization? Explain Synchronization process in java with example.	3	4	7M
		Unit-V			
5	a	i) Write program to create and use an inner class in java?	3	5	7M
		ii) Explain about container classes with an example program	3	5	7M
		OR			
	b	i) What is the purpose of passing parameters to an applet in java?	3	5	7M
		ii) Explain about event listeners in java with example programs.	3	5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20AI3204

DEEP LEARNING

Time: 3 hours

CSE (AI)

Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Discuss the following a) Bias and Variance trade off b) Parameter Vs hyper parameter	K4	CO1	7M
			ii) Demonstrate various challenges that are motivating Deep Learning	K2	CO1	7M
			OR			
	b		i) Discuss gradient descent algorithm and its types	K2	CO1	7M
			ii) Illustrate the steps that are required to build a machine learning model.	K2	CO1	7M
			Unit-II			
2	a		i) Draw the architecture of Deep Feed Forward Networks and discuss about it	K2	CO2	7M
			ii) Summarize Semi-Supervised Learning, Multitask Learning.	K2	CO2	7M
			OR			
	b		i) Discuss the importance of regularization and its types in deep learning	K2	CO2	7M
			ii) Discuss Back-Propagation and Other Differentiation Algorithms	K2	CO2	7M
			Unit-III			
3	a		i) Illustrate various Algorithms with Adaptive Learning Rates.	K2	CO3	7M
			ii) Define optimization and discuss how it differs from learning	K4	CO3	7M
			OR			
	b		i)Discuss the following a) Parameter Initialization Strategies b) Meta-Algorithms	K2	CO3	7M
			ii) Demonstrate various Challenges in Neural Network Optimization	K1	CO3	7M
			Unit-IV			
4	a		i) Draw the architecture of CNN and discuss about different layers in it.	K2	CO4	7M
			ii) Give the differences between ANN and CNN	K4	CO4	7M
			OR			
	b		i) Discuss about the Neuro-scientific Basis for Convolutional Networks.	K2	CO4	7M
			ii) Explain about different layers that can be used in feature extraction process in CNN	K2	CO4	7M
			Unit-V			
5	a		i) Define sequence modeling and discuss RNN	K2	CO5	7M
			ii) Compare CNN and RNN	K4	CO5	7M
			OR			
	b		i) Discuss various types of RNN in detail	K2	CO5	7M
			ii) Explain the following a) Deep Recurrent Networks b) Optimization for Long-Term Dependencies	K2	CO5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20AI3206
Time: 3 hours
NATURAL LANGUAGE PROCESSING
CSE (AI)
Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i)List out in detail about the phases in NLP.	K2	CO1	7M
		ii) Explain different ways to deal with spelling errors in NLP.	K3	CO1	7M
		OR			
	b	i)Explain in detail the importance of parts-of-speech in NLP.	K4	CO1	7M
		ii)Write various applications of NLP in detail.	K3	CO1	7M
		Unit-II			
2	a	i)Explain the importance and need of Extrinsic and Intrinsic evaluation types in NLP.	K4	CO2	14M
		OR			
	b	i)Explain the need and importance of Neural Language Model with a case study in detail.	K3	CO2	14M
		Unit-III			
3	a	i)Discuss the importance, need and implementation of Parts-of-speech Tagging in NLP.	K3	CO3	14M
		OR			
	b	i)Discuss in detail about Rule based tagging.	K2	CO3	7M
		ii)Elaborate in detail on TBL tagging.	K3	CO3	7M
		Unit-IV			
4	a	i)Define in detail about top down and bottom-up parsing in detail.	K2	CO4	7M
		ii)Differentiate both top down parsing and bottom-up parsing.	K3	CO4	7M
		OR			
	b	i)What do you mean by parsing. Explain its need in detail.	K3	CO4	7M
		ii) Explain in detail bout PCFG.	K2	CO4	7M
		Unit-V			
5	a	i)Discuss in detail about SVD algorithm.	K3	CO5	7M
		ii)Explain the importance of Latent Semantic Analysis method in detail.	K2	CO5	7M
		OR			
	b	i)Discuss in detail about the Skip-gram and CBOW.	K3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20IT3202   AGILE METHODOLOGIES

Time: 3 hours   (IT)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i)Differentiate in between Traditional model vs Agile model?	K4	CO1	7M
		ii)Explain about Agile Manifesto and principles?	K2	CO1	7M
		OR			
	b	i)Determine about various Agile drivers?	K3	CO1	7M
		ii)Illustrate the process of Agile documentation?	K4	CO1	7M
		Unit-II			
2	a	i)Write about "Crystal" development process?	K6	CO2	7M
		ii)Explain about Adaptive software development Process?	K2	CO2	7M
		OR			
	b	i)Describe various phases of Agile software development life cycle phases?	K3	CO2	7M
		ii)Explain about different types of work products?	K2	CO2	7M
		Unit-III			
3	a	i)what are Agile information systems? Explain Agile Decision making Process?	K3	CO3	7M
		ii)Explain about Story card Maturity Model(SMM)?	K2	CO3	7M
		OR			
	b	i)List out the different challenges to Migrate towards Agile Methodologies?	K4	CO3	7M
		ii)Explain about Institutional Knowledge evaluation cycle?	K2	CO3	7M
		Unit-IV			
4	a	i) Sketch the Agile requirements Abstraction Model?	K3	CO4	7M
		ii)Explain about various current Agile practices?	K2	CO4	7M
		OR			
	b	i)Determine the unstable requirements management?	K3	CO4	7M
		ii) Explain the concurrency in Agile requirements generation?	K2	CO4	7M
5		**Unit-V**			
	a	i)Explain about various Agile Metrics?	K2	CO5	7M
		ii) Describe about Feature Driven Development?	K4	CO5	7M
		OR			
	b	i)Explain about Test driven development approach?	K2	CO5	7M
		ii)Explain about Agile Approach in Global Software Development?	K2	CO5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Regular & Supple. Examinations, March-2024

Sub Code: R20CC3201 CRYPTOGRAPHY AND NETWORK SECURITY

CSE, CSE (AI), IT   Max. Marks: 70

Time: 3 hours

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain the security attacks, Secuirty services and mechanisms defined by X.800	2	1	14M
		OR			
	b	i) What are the different transposition techniques? Explain	2	1	7M
		ii) Compare and Contrast Block ciphers and Stream ciphers	4	1	7M
		Unit-II			
2	a	i) Draw the general structure of DES. Explain the encryption and decryption process	2	2	14M
		OR			
	b	i) Which four tasks are performed in each round of AES Cipher? Explain	2	2	14M
		Unit-III			
3	a	i) Explain the Chinese remainder theorem with an example	2	3	7M
		ii) State and Describe Fermat's theorem	2	3	7M
		OR			
	b	i) Given p=19, q=23, and e=3 Use RSA algorithm to find n, $\phi(n)$ and d.	3	3	7M
		ii)Explain ElGamal Crypto System with example	2	3	7M
		Unit-IV			
4	a	i) Illustrate in detail about the message authentication code and its requirements	3	4	14M
		ii) With a neat diagram, explain the steps involved in SHA algorithm for encrypting a message with maximum length of less than 2128 bits and produces as output a 512 bit message digest.			
		OR			
	b	i) Describe signing and verification in Digital Signature Algorithm	2	4	7M
		ii) Describe the process involved in digital signatures. Explain about different digital signatures.	2	4	7M
		Unit-V			
5	a	i) Write about the usage of session keys, Public and Private keys in PGP	2	5	7M
		ii)Explain the authentication procedures defined by X.509 certificate.	2	5	7M
		OR			
	b	i) Explain the SSL architecture with neat sketch	2	6	7M
		ii) Explain the different types of firewalls	2	6	7M

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC3204　　　　**MACHINE LEARNING**

Time: 3 hours　　　　　　　　　　(CSE, IT)　　　　　　　Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) The complexity of most learning algorithms is a function of the training set, can you suggest and explain filtering algorithms that finds redundant instances.	K2	CO1	7M
		ii) Explain the concept of Bayesian Decision theory classification with example.	K2	CO1	7M
		OR			
	b	i) List and explain methods for model selection and generalization	K2	CO1	7M
		ii) Differentiate any SIX differences Linear Regression and Multiple Linear Regression.	K2	CO1	7M
		Unit-II			
2	a	i)Explain the concept of maximum likelihood estimation by choosing proper density function with respect to class	K2	CO2	7M
		ii) When the training set is small, the contribution of variance to error may be more than that of bias and in such a case; we perform prefer a simple model even though we know that it is too simple for the task. Can you elaborate with an example	K2	CO2	7M
		OR			
	b	i) Examine the concept of model selection procedures.	K2	CO2	7M
		ii) Explain the procedure that can be used for fine-tuning the model complexity.	K2	CO2	7M
		Unit-III			
3	a	i)Explin Linear Discriminant Analysis with example.	K5	CO3	7M
		ii) Explain three different measures that are frequently calculated in association rules.	K5	CO3	7M
		OR			
	b	i) Consider the following dataset and we will find frequent itemsets and generate association rules for them and given minimum support count is 2 and TID / items table below minimum confidence is 60%	K5	CO3	7M
		ii) Evaluate any FIVE differences between Fp-growth and Apriori	K5	CO3	7M

TID	items
T1	I1, I2 , I5
T2	I2,I4
T3	I2,I3
T4	I1,I2,I4
T5	I1,I3
T6	I2,I3
T7	I1,I3
T8	I1,I2,I3,I5
T9	I1,I2,I3

		Unit-IV			
4	a	i) Explain K-means clustering algorithm and evaluate the sample data to generate three clusters (K=3)	K4	CO4	7M
		ii)Outline the process of making k-means robust to outliers	K4	CO4	7M
		OR			
	b	i) Explain the concept Expectation Maximization Algorithm with an example.	K4	CO4	7M
		ii)In Hierarchical clustering, how can we have locally adaptive distances, with advantages and dis-advantages	K4	CO4	7M
5		Unit-V			
	a	i)Illustrate Decision Tree vs Random Forest	K5	CO5	7M
		ii) Explain appropriate problems for decision tree learning	K5	CO5	7M
		OR			
	b	i)Explain working principle of Random Forest.	K5	CO5	7M
		ii) Explain the procedure to select the pruning mechanism and extract rules from the tree	K5	CO5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC3205   ADVANCED JAVA AND WEB TECHNOLOGIES

Time: 3 hours   CSE, CSE(AI)   Max. Marks: 70

Note: Answer All FIVE Questions.   All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain the Servlet Lifecyle in detail with example code.	K4	1	7M
		ii) Distinguish between GenericServlet and HttpServlet and develop a servlet by inheriting HttpServlet.	K4	1	7M
		OR			
	b	Explain in how many ways session tracking can be done with code.	K4	1	14M
		Unit-II			
2	a	i)Write the advantages of JSPs over Servlets and explain the anatomy of the JSP page.	K4	2	7M
		ii)Explain all the JSP Directives in detail	K4	2	7M
		OR			
	b	i)Describe what is JSTL. Write about any 4 jstl core tags.	K2	2	7M
		ii)Demonstrate the use of all Scriptlets present in JSP	K2	2	7M
		Unit-III			
3	a	Explain all the JSP implicit objects in detail with examples	K4	3	14M
		OR			
	b	i)Explain how to pass the control between JSP pages	K4	3	7M
		ii)Write note on scope of JSP objects	K2	3	7M
		Unit-IV			
4	a	i)Explain JDBC Architecture with neat diagram.	K4	4	7M
		ii)Describe all the 4 types of JDBC Drivers	K2	4	7M
		OR			
	b	i) Explain how to access database from JSP page?	K4	4	7M
		ii) Explain how to delete data from database using JSP page.	K4	4	7M
		Unit-V			
5	a	i)Explain any five built in functions of Arrays in PHP with example code.	K4	5	7M
		ii)Describe different types of arrays in PHP.	K3	5	7M
		OR			
	b	i) Construct a PHP script to insert the data into MYSQL database	K3	6	7M
		ii) Construct a PHP script to retrieve the data from MYSQL database	K3	6	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC3206   **BIG DATA ANALYTICS**

Time: 3 hours   (CSE, IT)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Explain about Google File System and its Architecture.	K4	CO1	7M
			ii) Distinguish between standalone mode and Pseudo-distributed mode.	K4	CO1	7M
			OR			
	b		i) Summarizing the building blocks of Hadoop.	K2	CO1	7M
			ii) Explain about Fully distributed mode.	K4	CO1	7M
			Unit-II			
2	a		i)Explain Map Reduce architecture .	K4	CO2	7M
			ii) Comparing old and new java Map Reduce APIs.	K2	CO2	7M
			OR			
	b		i) Implement any one basic program of Hadoop MapReduce.	K3	CO2	7M
			ii) Analyze map reduce on weather data set.	K4	CO2	7M
			Unit-III			
3	a		i) Illustrate in detail of the Apache Spark.	K4	CO3	7M
			ii) Illustrate in detail of persistence with an example	K4	CO3	7M
			OR			
	b		i) Categorizing and discuss RDDs Operations	K4	CO3	7M
			ii) Explain How to Create RDDs in Apache Spark?	K4	CO3	7M
			Unit-IV			
4	a		i) List the Pig Latin operators and explain any four types of operators.	K4	CO4	7M
			ii) Sketch the Pig Architecture with explanation	K3	CO4	7M
			OR			
	b		i) Illustrate in detail of Pig Latin Application Flow	K4	CO4	7M
			ii) Explain Evaluating Local and Distributed Modes of Running Pig Scripts	K4	CO4	7M
			Unit-V			
5	a		i) Examine creating and managing database and tables in HIVE	K4	CO5	14M
			OR			
	b		i) Explain architecture of HIVE.	K4	CO5	7M
			ii) List and Explain Hive Data Manipulation Language Instructions	K4	CO5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular & Supple. Examinations, April-2024

Sub Code: R20CC2OE16 **CLOUD COMPUTING**

Time: 3 hours (IT, CSE & AI(CSE)) Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a	i)	Explain the Client Server technology with advantages and disadvantages	2	1	7M
		ii)	Explain the Evaluation of Cloud Computing from grid Computing	2	1	7M
			OR			
	b	i)	Explain the benefits of Cloud Computing	2	1	7M
		ii)	Discuss the characteristics of Cloud Computing	2	1	7M
			Unit-II			
2	a	i)	Explain the different types of virtualization	2	1	14M
			OR			
	b	i)	Explain the Cloud Computing architecture on the basis of cloud balancing and storage management	2	2	7M
		ii)	Explain the Grid Architecture with neat sketch	2	2	7M
			Unit-III			
3	a	i)	Explain the SaaS and PaaS with examples	2	2	7M
		ii)	Discuss about the Jericho cloud cube model.	2	2	7M
			OR			
	b	i)	Explain about Cloud Stack in detail	2	2	7M
		ii)	Explain the public cloud with example	2	2	7M
			Unit-IV			
4	a	i)	Explain the disaster recovery planning	2	3	7M
		ii)	How to create a geographical redundancy. Explain.	2	3	7M
			OR			
	b	i)	Compare and Contrast the Traditional IT Services and Cloud Services	4	3	7M
		ii)	Discuss about the need of web applications in Cloud Computing	2	3	7M
			Unit-V			
5	a	i)	What is Microsoft Azure? Explain different Types of Azure Clouds	2	4	7M
		ii)	Compare and Contrast Traditional vs. Azure Cloud Model,	4	4	7M
			OR			
	b	i)	Explain the Application Services of AWS	2	4	7M
		ii)	Explain the Advantages and disadvantages of AWS	2	4	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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III B.Tech II Semester Regular Examinations, April-2024

Sub Code: R20AIHN04   **SPEECH PROCESSING**

Time: 3 hours   (AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i)Illustrate the history of current most important models and algorithms using in speech processing.	3	1	7M
			ii)Elaborate basic regular express patterns for the following statement: "Any PC with more than 500 MHz and 32 Gb of disk space for less than $1000"	2	1	7M
			OR			
	b		i) How does Turing test shows a solution for a machine to think was essential? Explain.	3	1	7M
			ii) Illustrate the process of generating the Sentences randomly from four N-gram models computed from Shakespeare's works.	3	1	7M
			Unit-II			
2	a		i)How does parts of speech assigning a syntactic class marker to each word in a corpus? Explain in detail.	3	2	7M
			ii) Illustrate the process of tuning the parameters using "devtest".	3	2	7M
			OR			
	b	i)	How does HMM Parts of speech works? Illustrate the process.	3	2	7M
		ii)	Discuss the role of confusion matrix in noisy channel model for spelling process.	2	2	7M
			Unit-III			
3	a	i)	i)Describe how phones are produced articulatorily by the vocal organs.	2	3	7M
		ii)	Translate the pronunciations of the following color words from the IPA into the ARPAbet and explain the process: a. [rEd] b. [blæk] c. [pjus] d. [blu] e [wait]	4	3	7M
			OR			
	b		Discuss in detail about phonological categories and pronunciation variation	2	3	14M
			Unit-IV			
4	a	i)	Summarize the process of speech synthesis with a neat architecture.	2	4	7M
		ii)	Explain the process of converting graphemes to phonemes with a neat diagram.	2	4	7M
			OR			
	b	i)	Discuss in detail about various steps involved in building a diphone database.	2	4	7M
		ii)	How does speech synthesis evaluate? Explain.	3	4	7M
			Unit-V			
5	a	i)	Draw a neat schematic architecture and explain the process for a speech recognizer decoding a single sentence.	3	5	7M
		ii)	Explain the process of extracting a sequence of 39 dimensional MFCC feature vectors from a quantized digitized wave form.	2	5	7M
			OR			
	b		How the HMM model is applied to speech recognition? Explain with an example.	3	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks ***

III B.Tech II Semester Regular Examinations, April-2024

Sub Code: R20CCMN40
FUNDAMENTALS OF MACHINE LEARNING
(ME)
Time: 3 hours
Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a	i)	List the problems that can be solved with machine learning.	K2	CO1	7M
		ii)	Write short notes on Vapnik Chervonenkis (VC) Dimension.	K2	CO1	7M
			OR			
	b		Discuss about different types of a Machine Learning models.	K1	CO1	14M
			Unit-II			
2	a	i)	Explain Bayesian Decision Theory in detail.	K2	CO2	7M
		ii)	Explain about Maximum Likelihood Estimation.	K2	CO2	7M
			OR			
	b	i)	What are the Prerequisites for Bayes Theorem?	K4	CO3	7M
		ii)	Discuss about the errors in Machine Learning?	K2	CO3	7M
			Unit-III			
3	a	i)	Explain the steps for Apriori Algorithm?	K4	CO3	7M
		ii)	Write the advantages and disadvantages of FP Growth Algorithm.	K1	CO3	7M
			OR			
	b		Discuss about the common techniques of Dimensionality Reduction?	K2	CO3	14M
			Unit-IV			
4	a	i)	What are the types of Clustering methods?	K2	CO4	7M
		ii)	Explain the Self Organizing Map algorithm?	K3	CO4	7M
			OR			
	b	i)	Explain the steps in Fuzzy Clustering algorithm?	K5	CO4	7M
		ii)	Define Clustering? What are the advantages and disadvantages of Fuzzy Clustering?	K4	CO4	7M
			Unit-V			
5	a	i)	How is a decision tree learned from data.	K3	CO5	7M
		ii)	Differentiate Decision Tree and Random Forest.	K3	CO5	7M
			OR			
	b		Discuss about the steps in Decision Tree Classification algorithm?	K3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Supple. Examinations, April-2024

Sub Code: R20ITHN03

ARTIFICIAL INTELLIGENCE

(IT)

Time: 3 hours

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain the Production Systems?	2	1	7M
		ii) Describe the characteristics of problems that are suitable for state space search approaches in AI	2	1	7M
		OR			
	b	i) Discuss the key issues involved in the design of search programs for solving complex problems in AI	2	1	14M
		Unit-II			
2	a	i) Explain the hill-climb method with different limitations using suitable Examples		2	14M
		OR			
	b	i) What is propositional logic in artificial intelligence? How it is different from predicate logic?	2	2	7M
		ii)Explain the Isa relationships in detail	2	2	7M
		Unit-III			
3	a	i) Differentiate between forward reasoning and backward reasoning in the context of rule-based systems	2	3	7M
		ii) Explain the role of control knowledge in rule-based systems and its impact on the inference process	2	3	7M
		OR			
	b	i)Differentiate between script and frame. Create an instantiated person frame for an individual Rakesh who is 60 years old doctor, lives in Baripada, Odisha with his wife Neha and two children Aman and Aryan.	2	3	14M
		Unit-IV			
4	a	i)Explain the learning neural network in detail	2	4	7M
		ii)Discuss the concept of rote learning	2	4	7M
		OR			
	b	i) Discuss the steps involved in implementing the Q-learning algorithm to solve a reinforcement learning problem.	2	4	14M
		Unit-V			
5	a	i) Describe semantic processing techniques with examples	2	5	14M
		OR			
	b	i) Describe how spell checking algorithms detect and correct spelling errors in text documents using techniques .Give Example	2	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular Examinations, April-2024

R20

Sub Code: R20CEHN07   SOLID WASTE MANAGEMENT

Time: 3 hours   (CE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) What are the Environmental implications of open dumping explain.	K2&K3	C01	7M
		ii) Write about functional elements of solid waste management system.	K2&K3	C01	7M
		OR			
	b	i) Write a short note on E- Waste Management.	K2&K3	C01	7M
		ii)what are the Regulatory aspects of solid waste management	K2&K3	C01	7M
		Unit-II			
2	a	i) write about waste storage and refuse collection	K2&K3	C02	7M
		ii) Discuss in detail about the waste collection system based on mode of operation.	K2&K3	C02	7M
		OR			
	b	i) Describe the engineering properties of waste.	K2&K3	C02	7M
		ii) What are the methods if on site storage and handling of solid waste?	K2&K3	C02	7M
		Unit-III			
3	a	i) Describe the operation of hauled container system and stationary container system.	K2&K3	C03	7M
		ii) What are the various facilities that must be available at transfer station?	K2&K3	C03	7M
		OR			
	b	i) Describe in detail the methods of collection system with flow diagram and the type of vehicle used for collection system.	K2&K3	C03	7M
		ii) Explain the methods of dealing by civic authorities with the NIMBY syndrome.	K2&K3	C03	7M
		Unit-IV			
4	a	i) Explain the terms 'Salvage and Segregation' and give their applications in different stages of Solid Waste Management	K2&K3	C04	7M
		ii) What is Incineration of solid wastes, explain in detailed.	K2&K3	C04	7M
		OR			
	b	i) Explain Mechanical and thermal volume reduction methods of waste.	K2&K3	C04	7M
		ii) Write about the following. a) vermicomposting, b) termigradation, c) fermentation	K2&K3	C04	7M
		Unit-V			
5	a	i) Design a suitable environmental monitoring system for a sanitary landfill site with sketch and components.	K2&K3	C05	7M

		ii) What are the various phases of operation of a landfill? Draw the neat sketch of a landfill.	K2&K3	C05	7M
		OR			
	b	i) Draw the diagram of double liner system of landfill and explain the functions of various components.	K2&K3	C05	7M
		ii) What is Leachate? What are the problems posed by Leachate and how would you overcome them?	K2&K3	C05	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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III B.Tech II Semester Supple. Examinations, April-2024

Sub Code: R20CC2OE06   **INDUSTRIAL ROBOTICS**

Time: 3 hours   EEE, CSE (AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) List out the applications of industrial robots.	K1	1	7M
		ii) Summarize advantages of robots.	K 1	1	7M
		OR			
	b	i) Summarize disadvantages of robots.	K 1	1	7M
		ii) Discuss on history of robots.	K 1	1	7M
		Unit-II			
2	a	i) Explain different types of actuators used in robots.	K 3	2	7M
		ii) Explain working principle of hydraulic devices used in robots.	K 3	2	7M
		OR			
	b	i) Explain working principle of stepper motor with the help of a neat sketch.	K 3	2	7M
		ii) Explain working principle of Pneumatic devices with the help of neat sketch.	K 3	2	7M
		Unit-III			
3	a	i) Summarize the use of sensors used in rotics.	K 1	3	7M
		ii) Discuss on basic elements of sensors	K 3	3	7M
		OR			
	b	i) Discuss on classification of Sensors.	K 3	3	7M
		ii) Explain the working principle of position sensor.	K 2	3	7M
		Unit-IV			
4	a	i) Differentiate kinematics with statics.	K4	4	7M
		ii) Discuss on D-H notation.	K1	4	7M
		OR			
	b	i) Explain the properties of The Jacobin matrix with a suitable example	K2	4	7M
		ii) Discuss on analytical methods used in robot kinematics.	K1	4	7M
		Unit-V			
5	a	i) Explain Path planning in robotics with a suitable example.	K2	5	7M
		ii) Explain how Material Transfer is done with the help of robots	K2	5	7M
		OR			
	b	i) Discuss on spray painting.	K1	5	7M
		ii) List out the advantages and disadvantages of robots in manufacturing.	K1	5	7M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

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III B.Tech II Semester Regular Examinations, April-2024

Sub Code: R20CSHN04 **AGILE WITH SCRUM**

Time: 3 hours (CSE) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) List and Explain Principles of Agile Methodology	K2	CO1	7M
		ii)Explain Traditional Project Management Methodologies.	K2	CO1	7M
		OR			
	b	List agile frameworks? Explain any frameworks.	K2	CO1	14M
		Unit-II			
2	a	i) Discuss about Scrum artifacts.	K4	CO2	7M
		ii)what are the scrum roles. Explain in detail.	K4	CO2	7M
		OR			
	b	i)Explain about scrum methodology and process.	K4	CO2	7M
		ii)what are the five scrum values. Explain.	K4	CO2	7M
		Unit-III			
3	a	i)Explain the importance of Agile Testing Quadrants	K2	CO3	7M
		ii)what is Test Driven Development (TDD)? How it is different from traditional testing. Explain.	K2	CO3	7M
		OR			
	b	i)List and explain benefits of Test Driven Development.	K2	CO3	7M
		ii)Discuss about risk of test automation in agile process.	K2	CO3	7M
		Unit-IV			
4	a	i)Explain Single Responsibility Principle with suitable example.	K2	CO4	7M
		ii)Discuss in detail about Dependency Inversion Principle.	K2	CO4	7M
		OR			
	b	i)Illustrate about The Liskov Substitution Principle (LSP)	K2	CO4	7M
		ii)What is the goal of The Interface Segregation Principle. Explain with suitable example.	K2	CO4	7M
		Unit-V			
5	a	i)Explain Six characteristics of an agile marketing team	K3	CO5	7M
		ii) Explain any one use case for agile marketing.	K3	CO5	7M
		OR			
	b	i) List and explain Seven agile marketing techniques to deliver projects effectively.	K3	CO5	7M
		ii) Differentiate Agile marketing and Traditional marketing.	K3	CO5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks***

III B.Tech II Semester Regular Examinations, April-2024

Sub Code: R20CCMN34 **SOFTWARE ENGINEERING**

Time: 3 hours (ECE,EEE) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1		**Unit-I**			
	a	i) Illustrate the process of Waterfall Model with a neat diagram.	3	1	7M
		ii) Elaborate the concept of Requirement analysis and specification.	2	1	7M
		OR			
	b	i) Discuss in detail about the steps of spiral model with a neat architecture	2	1	7M
		ii) Describe the functional and non functional requirements for the case study automated teller machine (ATM).	2	1	7M
2		**Unit-II**			
	a	i) Discuss in detail about the Conceptual Model of the UML.	2	2	7M
		ii) Design and discuss an interaction diagram for any system with the flows of Control by Time Ordering and organisation.	3	2	7M
		OR			
	b	i) How does identifies the SRS? Discuss about Requirements Elicitation, and Documentation	3	2	7M
		ii) Design Object diagram for the Bank ATM system and illustrate each component functionality.	3	2	7M
3		**Unit-III**			
	a	i) Discuss about the state machine terms and concepts.	2	3	7M
		ii) Illustrate the functioning of a Mobile Banking App by drawing an use case diagram.	3	3	7M
		OR			
	b	i) Elaborate the terms and concepts of the component diagram.	2	3	7M
		ii) Design Swimlane based Activity diagram for Sales Process by applying the control nodes, object nodes and action nodes using different flow edges.	3	3	7M
4		**Unit-IV**			
	a	i) Summarize the common modeling techniques of Activity Diagrams.	2	4	7M
		ii) Differentiate between forward and reverse Engineering. Also List out their characteristics.	3	4	7M
		OR			
	b	i) How to analyze and report the object model and dynamic model.	3	4	7M
		ii) Describe the common modeling techniques of Class Diagrams.	2	4	7M
5		**Unit-V**			
	a	i) Illustrate the functioning of various design patterns	3	4	7M
		ii) Explain in detail about black box testing techniques.	2	4	7M
		OR			
	b	i) Differentiate between dynamic object modeling and static Object modeling.	3	4	7M
		ii) Explain in detail about White box testing techniques.	2	4	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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