

R20

IV BTECH I SEM

END EXAMINATION QUESTION PAPERS

REGULAR & SUPPLEMENTARY

OCT./NOV. 2025

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CC4106 NATURAL LANGUAGE PROCESSING

Time: 3 hours

(IT), CSE (AIML), DS

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) What are the major phases of NLP, and how does each phase contribute to language understanding?	K2	CO1	7M
	ii) How does the Noisy Channel Model help in correcting spelling errors?	K3	CO1	7M
	OR			
	b i) How does ambiguity in word forms affect the efficiency of morphological analysis in NLP?	K2	CO1	7M
2	ii) What is the importance of Parts of Speech (POS) tagging in NLP?	K2	CO1	7M
	Unit-II			
	a i) Compare and contrast the N-gram language model with neural language models.	K2	CO2	7M
	ii) Define Neural Language Model, Case study: application of neural language model in NLP system development.	K2	CO2	7M
	OR			
3	b i) How does perplexity help evaluate the performance of a language model?	K2	CO2	7M
	ii) Explain the importance of smoothing in N-gram models. What are some common smoothing techniques?	K2	CO2	7M
	Unit-III			
	a i) How do neural models improve the accuracy of POS tagging compared to statistical approaches?	K2	CO3	7M
	ii) Explain Hidden Markov Model POS tagging in detail and apply Viterbi POS tagging for the following corpus. <S> Srinivas Srikanth can watch Rohith<E> <S> Satish will watch Srinivas<E> <S> Will Srikanth Spot Srinivas<E> <S>Srinivas Will pat spot<E> Test Sentence <S>Srikanth will spot Rohith<E>	K4	CO3	7M
4	OR			
	b i) How do rule-based and transformation-based learning (TBL) approaches differ in POS tagging? Explain in detail	K2	CO3	14M
4	Unit-IV			
	a i) What is the role of treebanks in syntactic parsing?	K2	CO4	4M
	ii) Find out the most likely parse tree and a table using PCFG for the following input and grammar. Input: a pilot likes flying planes	K4	CO4	10M

	Rules: S->NP VP [1.0] VP->VBG NNS[0.1] VP->VBZ VP [0.1] VP->VBZ NP [0.3] NP->DT NN [0.3] NP-> JJ NNS [0.4] DT-> a [0.3] NN-> pilot [0.1] VBZ-> likes [0.4] VBG-> flying [0.5] JJ-> flying [0.1] NNS->planes [0.34]				
	OR				
		i) How does Probabilistic Context-Free Grammar (PCFG) differ from traditional CFG. and why is it useful?	K2	CO4	4M
b	ii) What is Earley parsing? List down and explain its different operators used in Earley parsing. Parse the following input with the given grammar * using the Earley parsing algorithm. Input: astronomers saw stars with telescope. Rules: S->NP VP NP-> NP PP PP-> P NP NP-> N VP-> V NP VP-> VP PP N-> astronomers N-> telescope N-> stars P-> with V-> saw	K4	CO4	10M	
	Unit-V				
5	a	i) How can WordNet be used to distinguish between different meanings of a word like "bank"?	K3	CO5	7M
		ii) How does Latent Semantic Analysis (LSA) use Singular Value Decomposition (SVD) for word representation?	K2	CO5	7M
	OR				
	b	i) How can WordNet be used to perform word sense disambiguation in NLP?	K2	CO5	7M
ii).What role does Singular Value Decomposition (SVD) play in Latent Semantic Analysis (LSA)?		K2	CO5	7M	

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CE4102

WATERSHED MANAGEMENT

Time: 3 hours

(CE)

Max. Marks: 70

R20

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
Unit-I				
1	a Define watershed development programme. Also Explain how integrated and multi disciplinary approach will help watershed management.	K2	CO1	14M
	OR			
	b Briefly explain the concept need and objectives of watershed development	K2	CO1	14M
Unit-II				
2	a Explain in detail Physiographic characteristics and Climatic characteristics of watershed	K2	CO2	14M
	OR			
	b Discuss briefly the characteristics of watersheds related with climate land use vegetation geology and soils	K2	CO2	14M
Unit-III				
3	a Write the types of measures to control erosion discuss any four methods in detail with neat sketches	K2	CO3	14M
	OR			
	b i) List out the climatic factors that influence the Erosion. Explain them.	K2	CO3	7M
	ii) Explain types of erosion in detail	K2	CO3	7M
Unit-IV				
4	a Elaborate the techniques of rainwater harvesting for rooftop surface floor and sub surface flow	K2	CO4	14M
	OR			
	b Describe the role of check dam, farm ponds and percolation tanks in Rain Water Harvesting.	K2	CO4	14M
Unit-V				
5	a Explain land use and land capability. Explain in detail about the objectives and classification of land capability?	K2	CO5	14M
	OR			
	b Illustrate the reclamation of saline and alkaline soils	K2	CO5	14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CE4104

PRESTRESSED CONCRETE

Time: 3 hours

(CE)

Max. Marks: 70

R20

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) Why is the high strength of concrete and high grade of steel required for prestressed concrete?	2	1	7M
	ii) Explain any two methods of prestressing system.	2	1	7M
	OR			
	b i) What are the different types of flexural modes observed in prestressed concrete beams?	2	1	7M
2	ii) Explain with sketches Freyssinet system of post tensioning?	2	1	7M
	Unit-II			
	a A prestressed concrete beam 400mm x 400mm, is prestressed by 10 wires, each of 8mm diameter. The wires are initially stressed to 1200N/mm ² with their centroids located 60mm from the soffit. Calculate the final percentage loss of stress due to elastic deformation, creep, shrinkage and relaxation using the following data: $E_s = 210 \text{ kN/mm}^2$ and $E_c = 32 \text{ kN/mm}^2$, Creep coefficient $\epsilon = 1.6$, Residual shear strain $= 3 \times 10^{-4}$ Relaxation of steel stress $= 90 \text{ N/mm}^2$.	3	2	14M
	OR			
3	b A prestressed concrete beam 200 x 300 mm deep is prestressed with wires (area $= 320 \text{ mm}^2$) located at 50 mm from the bottom carrying an initial stress of 1000 N/mm ² . The span of the beam is 10 m. Calculate the percentage loss of prestress in wires when the beam is post-tensioned. Assume $E_s = 210 \text{ kN/mm}^2$, $E_c = 35 \text{ kN/mm}^2$. Relaxation of steel stress $= 5\%$ initial stress, shrinkage of concrete $= 200 \times 10^{-6}$, creep coefficient $= 1.6$, slip at anchorage $= 1 \text{ mm}$, friction coefficient $= 0.0015$ per metre.	3	2	14M
	Unit-III			
3	a i) A pre tensioned prestressed concrete beam having a rectangular section, 300mm wide and 500mm deep has an effective cover of 40mm. If $f_{ck} = 40 \text{ N/mm}^2$, $f_p = 1600 \text{ N/mm}^2$ and the area of prestressing steel $A_p = 561 \text{ mm}^2$. Calculate the ultimate flexural strength of the section using IS code provisions	3	3	14M

	OR				
	b	i) Explain different types of flexural failures with the help of sketches	2	3	7M
		ii) Write the Design procedure for flexure with Cable profile in two span continuous members.	2	3	7M
4	Unit-IV				
	a	i) Explain the procedure for computing short-term and long-term deflection of PSC beams.	2	4	7M
		ii) Discuss the various methods of predicting long-term deflections of uncracked prestressed concrete members.	2	4	7M
	OR				
	b	i) Explain the factors affecting long-term deflections briefly	2	4	14M
5	Unit-V				
		A rectangular beam 250 × 500 mm in section is simply-supported over a span of 10m. It is prestressed with a parabolic cable which has a maximum eccentricity of 200 mm at midspan and 40 mm at support sections. Effective prestressing force is 1450 kN. Concrete grade is M40. Determine the deflection due to prestress and self weight.	3	5	14M
	OR				
	b	i) Discuss the various methods of predicting long term deflections	2	5	7M
		ii) Explain the various modes of failure encountered in prestressed concrete beams subjected to bending, shear and torsion.	2	5	7M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CE4107

ESTIMATION COSTING AND VALUATION

Time: 3 hours

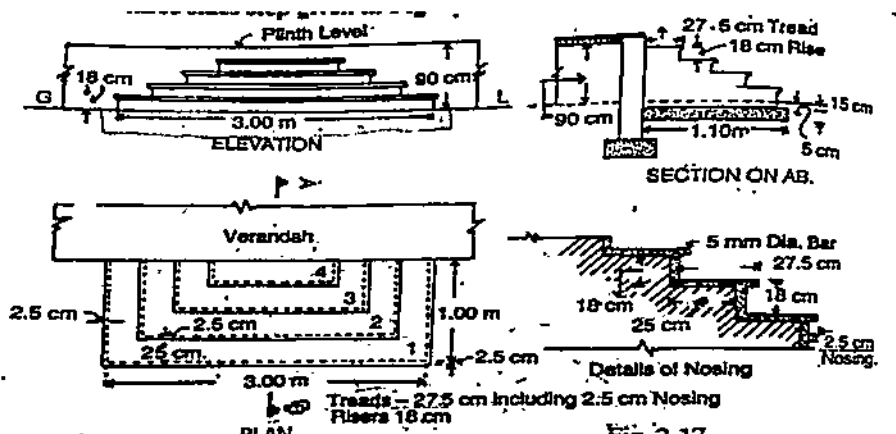
(CE)

Max. Marks: 70

R20

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) Explain any Four general items of a building in detail with Sketch	K2	CO1	7M																				
		ii) Mention the Units of measurements for Steel reinforcement, plastering and flooring	K3	CO1	7M																				
	OR																								
	b	i) Estimate the quantities of Earthwork, Concrete, Brickwork and Finishing work for three sides step given in the fig.	K3	CO1	14M																				
 Fig. 2-17																									
2	Unit-II																								
	a	i) Estimate the Quantity of earth work in cutting for a road of 10 m formation width With the following data using mean sectional area method are trapezoidal method side slope is 2:1 (H:V) and no cross slope	K3	CO2	14M																				
		<table><tr><td>Chainage (m)</td><td>0</td><td>30</td><td>60</td><td>90</td><td>120</td><td>150</td></tr><tr><td>ground level</td><td>80.50</td><td>79.30</td><td>81.40</td><td>84.00</td><td>85.10</td><td>83.00</td></tr><tr><td>formation level</td><td>75.00</td><td colspan="5">Rising Gradient of 1 in 30</td></tr></table>	Chainage (m)	0	30	60	90	120	150	ground level	80.50	79.30	81.40	84.00	85.10	83.00	formation level	75.00	Rising Gradient of 1 in 30						
	Chainage (m)	0	30	60	90	120	150																		
	ground level	80.50	79.30	81.40	84.00	85.10	83.00																		
formation level	75.00	Rising Gradient of 1 in 30																							
OR																									
b	i) Determine the methods to be adopted to calculate the volume	K2	CO2	7M																					
ii) list the factors that affect the estimation of the final cost of the building	K2	CO2	7M																						
3	Unit-III																								
	a	i) The following width of road embankment is 7.5m. The side slopes are 2.5:1. The depth along the centre line road at 50m intervals are obtained as 1.59, 1.20, 1.76, 1.24, 1.37, 1.10, 1.42, 1.05m. Calculate the Quantity of earthwork by Prismoidal method and Trapezoidal method.	K3	CO3	7M																				
		ii) Distinguish between detailed specifications and general specifications with example?	K2	CO3	7M																				

	OR				
	b	i) Explain the necessity of specifications and types of Specifications?	K2	CO3	7M
		ii) The formation width of road embankment is 9.0m. The side slopes are 2.5:1. The depths along the center line of road at 50.0m intervals are 1.2,1.1,1.4,1.2,0.9,1.5 and 1.0m.It is required to calculate the quantity of earthwork by (i) Prismoidal rule. (ii) Trapezoidal rule	K3	Co3	7M
4	Unit-IV				
	a	i) Discuss in detail about preparing rate analysis for road works	K2	CO4	7M
		ii) Discuss about the general principles of contracts documents.	K2	CO4	7M
	OR				
	b	i) Explain about Earnest Money, Security Money, measurement book	K2	CO4	7M
		ii) Explain the types of tenders and requirement of tendering	K2	CO4	7M
5	Unit-V				
	a	i) Elaborate about out turn of works	K2	CO5	7M
		ii) Explain in detail about various Methods of valuation	K2	CO5	7M
	OR				
	b	i) What is depreciation? Explain the different methods of depreciation.	K2	CO5	7M
		ii) An old building has been purchased by a person at a cost of Rs.30000/- excluding the cost of the land. Evaluate the amount of the annual sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase	K4	CO5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20EE4104

FLEXIBLE AC TRANSMISSION SYSTEMS

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
1	Unit-I				
	a	i) Discuss in detail about the dynamic stability considerations of FACTS devices?	2	1	7M
		ii) Elaborate the requirements and characteristics of high power devices?	2	1	7M
	OR				
	b	i) Elaborate the importance of controllable parameters with an example?	2	1	7M
		ii) Explain the basic types of FACTS controllers with circuit diagrams?	2	1	7M
2	Unit-II				
	a	i) Draw the output characteristics and explain the three phase current source converter with circuit diagram?	2	2	7M
		ii) Describe the effects of harmonics for a single phase bridge converter with necessary waveforms?	2	2	7M
	OR				
	b	i) Draw the output characteristics and explain the voltage source converter with circuit diagram?	2	2	7M
		ii) Explain the existence and characteristic features of square wave voltage?	2	2	7M
3	Unit-III				
	a	i) Summarize the objectives of shunt compensation?	4	3	7M
		ii) Describe the voltage regulation for line segmentation with relevant expressions?	4	3	7M
	OR				
	b	i) Explain the procedure for end of line voltage support with respect to the voltage stability?	4	3	7M
		ii) Discuss in detail about the power oscillation damping with an example?	4	3	7M
4	Unit-IV				
	a	i) What is meant by the operating point control? Explain the procedure with objectives?	5	4	7M
		ii) Draw the circuit diagram and explain in detail about the static VAR compensator?	5	4	7M
	OR				
	b	i) Derive and explain the slope transfer function of static compensator?	5	4	7M
		ii) Explain how the transient stability is improved by using shunt compensator?	5	4	7M
5	Unit-V				
	a	i) Draw the diagram and explain the effect of thyristor switched	3	5	7M

		series capacitor on the system performance with relevant to the compensation?			
		ii) Discuss in detail about the functional requirements and drawbacks of series compensators?	3	5	7M
	OR				
	b	i) Draw the diagram and explain the effect of thyristor controlled series capacitor on the system performance with relevant to the compensation?	3	5	7M
		ii) Explain in detail about the basic operating principles of unified power flow controllers?	3	5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20EE4109

POWER SYSTEM OPERATION AND CONTROL

Time: 3 hours

(EEE)

Max. Marks: 70

R20

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) Explain about Heat rate curve, Incremental fuel rate curve and Incremental production cost curve with reference to thermal plants	K2	1	7M
	ii) What are B-coefficients? Derive them	K3	1	7M
	OR			
	b i) Obtain the condition for optimum operation of a power system with 'n' plants including the effect of transmission losses. ii) The fuel input per hour of plant 1 and 2 are given as $C_1 = 0.25 P_1^2 + 42 P_1 + 110 \text{ Rs/h}$ $C_2 = 0.3 P_2^2 + 35 P_2 + 160 \text{ Rs/h}$ Determine the economic operating schedule and the corresponding cost of generation if the max and min loading on each unit is 110 MW and 35 MW, the demand is 190 MW and transmission losses are neglected. If the load is equally shared by both the units, determine the saving obtained by loading the units as per equal incremental production cost.	K2 K3	1 1	7M 7M
2	Unit-II			
	a i) Mention the merits of operating hydro-thermal combinations.	K2	2	7M
	ii) Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants.	K3	2	7M
	OR			
	b Using dynamic programming method to determine the most economical units to be committed to supply a load of 6 MW. There are four units with the following data: $C_1 = 0.8 P_1^2 + 21 P_1$, $C_2 = 0.6 P_2^2 + 22 P_2$, $C_3 = 0.5 P_3^2 + 21 P_3$ and $C_4 = 0.6 P_4^2 + 20 P_4$. The maximum and minimum limits for each unit are 6 MW and 1 MW respectively.	K3	2	14M
3	Unit-III			
	a i) What is single area system? With the help of block diagram deduce dynamic models for single area system.	K2	3	7M
	ii) A 220 MVA synchronous generator is operating at 3000 rpm, 50Hz. A load of 50MW is suddenly applied to the machine and the steam valve of the turbine opens only after 0.45 sec due to the time lag in the generator action. Calculate the frequency to which the generated voltage drops before the steam flow commences to increase to meet the new load. Given that the value of H of the generator is 5.8 kW-sec/KVA of the generator capacity.	K3	3	7M
	OR			
	b i) A 500 MVA synchronous generator operates on full load at a frequency of 50 Hz. The load is reduced to 400 MW. The steam valve begins to operate with a time lag of 0.5 seconds. Determine the change in frequency if H=5 kW-sec/KVA.	K3	3	7M

		ii) With the help of block diagram explain clearly about proportional and integral load frequency control and show that frequency change in steady state is zero.	K3	3	7M
4	Unit-IV				
	a	i) Draw the block diagram of load frequency control in two area control system and explain.	K2	4	7M
		ii) Distinguish between load frequency control and economic dispatch control.	K2	4	7M
	OR				
	b	i) Describe the economic dispatch control with necessary diagram.	K2	4	4M
		ii) Analyse the change in load frequency in a two area LFC system when a step increment in the load with speed changer setting constant.	K2	4	10M
5	Unit-V				
	a	i) Explain the effects on uncompensated line under no load and load conditions.	K2	5	7M
		ii) A three-phase induction motor delivers 520 hp at an efficiency of 0.92, the operating power factor being 0.77 lagging. A loaded synchronous motor with a power consumption of 110 KW is connected in parallel with the induction motor. Calculate the necessary kVA and the operating power factor of the synchronous motor if the overall power factor is to be unity.	K3	5	7M
	OR				
	b	i) Explain the Static shunt capacitor Compensator and Static series capacitor Compensator for System Control.	K2	5	7M
		ii) Explain the need of FACTS controllers in transmission systems.	K2	5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20EE4111

SWITCHGEAR AND PROTECTION

Time: 3 hours

(EEE)

Max. Marks: 70

R20

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
1	Unit-I			
	a Discuss about the SF ₆ circuit breaker with neat sketch and its advantages.	K2	Co1	14M
	OR			
	b i) Explain the phenomenon of current chopping in circuit breaker. ii) Write a short on minimum oil circuit breaker with neat sketch.	K2 K3	Co1 Co1	7M 7M
2	Unit-II			
	a i) Discuss the construction and operation of attracted armature relay. ii) Explain the operation of directional over current relay with a neat circuit diagram.	K2 K3	Co2 Co2	7M 7M
	OR			
	b i) What is impedance relay? Explain its operating principle and characteristics on R-X diagram. ii) Explain in detail about the time current characteristics of IDMT relay.	K1 K2	Co2 Co2	7M 7M
3	Unit-III			
	a i) Discuss the protection employed against loss of excitation of an alternator. ii) Draw the circuit diagram of a restricted earth fault protection scheme for a 3-phase alternator?	K2 K2	Co3 Co3	7M 7M
	OR			
	b i) Discuss in detail about differential protection of a transformer. ii) A 3-phase transformer having line voltage ratio 15KV/220KV is connected in star-delta and protective transformer on 220KV side have a current ratio 50/5. what must be the ratio of protective transformer on 15KV side?	K2 K3	Co3 Co3	7M 7M
4	Unit-IV			
	a i) Explain about the protection of ring main feeder using over current relays. ii) Briefly discuss about the carrier current protection with neat sketch.	K2 K3	Co4 Co4	7M 7M
	OR			
	b i) briefly describe about the three-zone protection using distance relays. ii) Describe the types of protection scheme employed for protection of busbar.	K1 K2	Co4 Co4	7M 7M
5	Unit-V			
	a i) Discuss how the static directional relay works to get the directional characteristics? ii) Derive the R-X characteristics of static ohm and reactance relays.	K3 K2	Co5 Co5	7M 7M
	OR			
	b i) Draw and explain the operational block diagram of microprocessor based static relay. ii) Explain static over current relay with neat block diagram.	K3 K2	Co5 Co5	7M 7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20ME4102

DIGITAL MANUFACTURING

Time: 3 hours

(ME)

Max. Marks: 70

R20

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) Explain the role of Industry 4.0	K2	CO1	7M
		ii) Compare Smart Manufacturing With Traditional Manufacturing.	K2	CO1	7M
	OR				
	b	Explain in detail nine pillars of smart manufacturing (Industry 4.0)	K2	CO1	14M
2	Unit-II				
	a	i) Illustrate Benefits of Smart Factory Implementation.	K2	CO2	7M
		ii) Explain in short about smart-predictable manufacturing.	K2	CO2	7M
	OR				
	b	What you understood by agile manufacturing? and also explain the differences between lean manufacturing and agile manufacturing.	K4	CO2	14M
3	Unit-III				
	a	Classify the Communication Technologies for Smart Manufacturing Systems.	K4	CO3	14M
	OR				
	b	Discuss the role of Industrial Artificial Intelligence in current manufacturing systems.	K4	CO3	14M
4	Unit-IV				
	a	List out the smart manufacturing technologies and explain in brief.	K4	CO4	14M
	OR				
	b	i) Differentiate between NC and CNC machines.	K2	CO4	7M
		ii) Discuss the role of computer aided part programming in smart manufacturing.	K3	CO4	7M
5	Unit-V				
	a	What is productivity? Explain in detail the different types of productivity measures.	K4	CO5	14M
	OR				
	b	Explain in detail about Sizing the Gaps, Man, Machines and Product Flow.	K4	CO5	14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20ME4107

FINITE ELEMENT METHOD

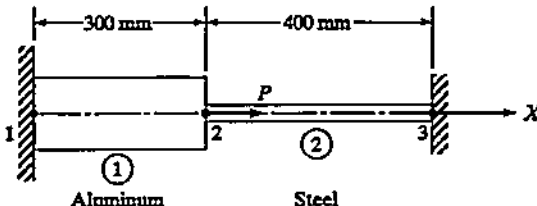
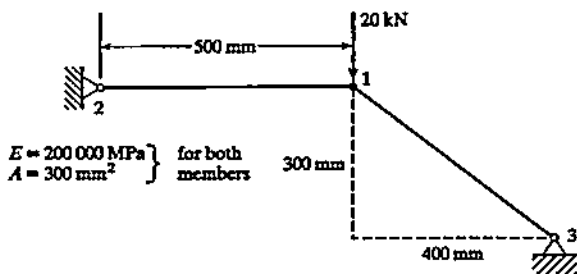
Time: 3 hours

(ME)

Max. Marks: 70

R20

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) Explain the steps involved in FEM to solve engineering problems.	K3	CO1	7M
	ii) Determine the stress-strain relations for a three-dimensional element.	K3	CO1	7M
	OR			
	b i) Derive the strain displacement relationship for 2D situation.	K3	CO1	7M
	ii) Explain the advantages and applications of FEM.	K2	CO1	7M
2	Unit-II			
	a i) State and explain the principle of minimum potential energy.	K3	CO2	7M
	ii) Explain in detail the finite element modelling of a one-dimensional problem.	K3	CO2	7M
	OR			
	b Consider the bar as shown in the below Fig.1. An axial load $P = 150 \times 10^3$ N is applied as shown. Using the penalty approach for handling boundary conditions, determine the nodal displacements, stress in each material and the reaction forces. The Area of Aluminum and steel are 2400 mm^2 and 600 mm^2 respectively and $E_{Al} = 70 \times 10^9 \text{ N/m}^2$ and $E_{Steel} = 200 \times 10^9 \text{ N/m}^2$.	K4	CO2	14M
	 Fig.1.			
3	Unit-III			
	a Consider the Two-bar truss shown in Fig.2, determine the displacements of node 1 and the stress in elements 1-3.	K4	CO3	14M
	 Fig.2.			
	OR			
	b Analyse the beam shown in Fig.3 by finite element method and determine the end reactions. Also determine the deflections at mid spans given $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 5 \times 10^5 \text{ mm}^4$.	K4	CO3	14M

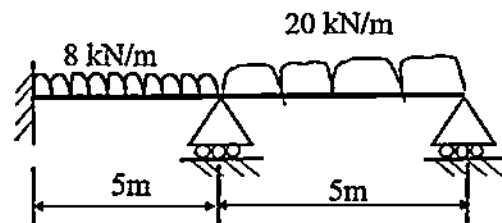


Fig.3.

Unit-IV

- a) i) Derive the stiffness matrix for CST element using finite element discretization process

K3

CO4

14M

OR

Find the nodal displacements and element stresses in the propped beam shown in the Fig.4. Idealize the beam into two CST elements as shown in the Fig.4. Assume plane stress condition. $\mu = 0.25$, Take $E = 2 \times 10^5$ N/mm², thickness = 18 mm.

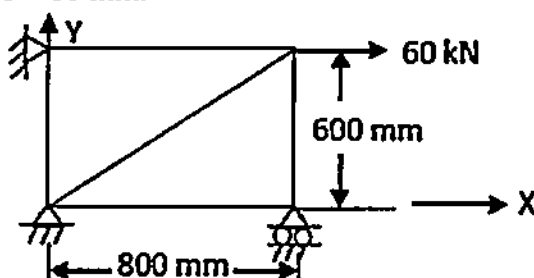


Fig. 4.

K4

CO4

14M

Unit-V

Determine the eigenvalues and eigenvectors for the stepped bar as shown in Fig.5. Take $E = 200$ GPa, $\rho = 7830$ Kg/m³.

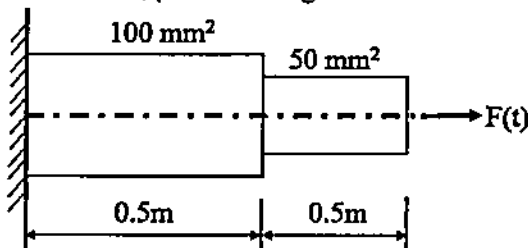


Fig. 5.

K4

CO5

14M

OR

Determine all natural frequencies of the simply supported beam as shown in Figure.6.

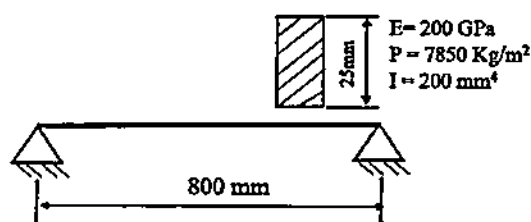


Fig. 6.

K4

CO5

14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20ME4116

ELECTRIC AND HYBRID VEHICLES

Time: 3 hours

(ME)

Max. Marks: 70

R20

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
1	Unit-I			
	a Classify electric vehicles and explain any one electric vehicle with neat sketch	K3	1	14M
	OR			
	b Explain the term rolling resistance and aerodynamic drag in vehicles and derive the expression for vehicle translational speed from fundamentals.	K3	1	14M
2	Unit-II			
	a i) Explain the impact of different transportation technologies on environment and energy supply.	K3	2	8M
	a ii) What are the basic techniques to improve Vehicle Fuel Economy? Explain.	K2	2	6M
	OR			
	b i) Illustrate the power flow control in hybrid electric drive train.	K3	2	7M
	b ii) Explain series flow in hybrid electric drive trains	K2	2	7M
3	Unit-III			
	a Discuss various electric drive train topologies	K3	3	14M
	OR			
	b Draw and explain the block diagram of Permanent Magnet Motor drive system.	K3	3	14M
4	Unit-IV			
	a i) Explain the Battery based energy storage and state their limitations.	K2	4	7M
	a ii) Explain the super capacitor based energy storage and also state its limitations.	K2	4	7M
	OR			
	b i) Explain the Fuel cell based energy storage and state their limitations.	K2	4	7M
	b ii) Explain the Flywheel based energy storage and also state its limitations.	K2	4	7M
5	Unit-V			
	a i) Explain the range modelling for Battery Electric Vehicles	K2	5	6M
	a ii) Explain the types of Driving Cycles for Fuel Cell EV and Solar Powered Vehicles	K2	5	8M
	OR			
	b Explain the design of a Hybrid Electric Vehicle (HEV) as a case study.	K3	5	14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20EC4102 CELLULAR AND MOBILE COMMUNICATION

Time: 3 hours

(ECE)

Max. Marks: 70

R20

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
1	Unit-I			
	a Explain the principle and operation of basic cellular system.	K2	1	7M
	a What are the various time dispersion parameters? Explain.	K1	1	7M
	OR			
	b Explain the normal case of carrier to interference ratio with Omni-directional antenna.	K2	2	7M
	b What is cell-splitting? What are the advantages of cell splitting?	K1	1	7M
2	Unit-II			
	a What are the various antenna parameters? How they effect the antenna design?	K1	2	7M
	a Define diversity. Describe the space diversity and polarization diversity.	K2	3	7M
	OR			
	b Explain the effect of propagation of mobile signals over a flat and hilly terrain.	K2	2	14M
3	Unit-III			
	a What is the significance of Umbrella pattern antennas? Explain.	K2	3	7M
	a Explain different cell site antennas.	K2	3	7M
	OR			
	b What is sectorization? What are the advantages of sectorization?	K1	3	7M
	b Illustrate about the non-fixed channel assignment.	K2	3	7M
4	Unit-IV			
	a Illustrate various handoff initiation techniques. List the advantages of handoff	K2	4	7M
	a Compare hard and soft handoff techniques.	K4	4	7M
	OR			
	b Write short note on i) Intersystem handoff ii) Forced handoff	K1	4	14M
5	Unit-V			

	a	Describe the GSM architecture with neat diagram.	K2	5	7M
		Compare TDMA and CDMA.	K4	5	7M
	OR				
	b	Demonstrate about CDMA channels.	K2	5	14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20EC4106

RADAR SYSTEMS

Time: 3 hours

(ECE)

Max. Marks: 70

R20

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
Unit-I				
1	i) Provide a block diagram of a simple form of radar system and describe the function of each component. What are the common radar frequencies used in real-time radar systems and their applications?	2	1	7M
	a ii) The engineering team is assessing a radar system designed for high-resolution tracking. The specifications for this radar system are as follows: Transmit Power (Pt): 10 Kw; Antenna Gain (G): 30 dBi; Operating Frequency (f): 5 GHz; Radar Cross Section (σ): 1 m ² ; Minimum Detectable Signal (Pr): -100 dBm . Simplify the radar equation (Simple form and Modified form), predict the maximum range at which the radar can detect a target. Show all calculations and explain the influence of each parameter on the predicted range.	4	1	7M
	OR			
	i) Discuss the different frequency bands used in radar systems, such as L-band, S-band, C-band, X-band, and Ku-band. Explain how the choice of frequency affects radar performance, including resolution, range, and Provide examples of applications that utilize each frequency band.	2	1	7M
2	b ii) The Delphi ESR (ElectroMagnetic Radar) system is used to track and detect objects at various distances. The specifications for this radar system are: Radar Cross Section (σ): 1 m ² ; Receiver Sensitivity (Pr): -80 dBm; Transmit Power (Pt): 1 kW ; Frequency: 10 GHz. Calculate the maximum unambiguous range of the Delphi ESR radar system.	3	1	7M
	Unit-II			
	a i) Explain the different types of radar waveforms used in radar systems, such as continuous wave (CW), pulse, and frequency-modulated (FM) waveforms. What are the advantages and disadvantages of each type? Provide examples of applications where specific waveforms are most effective.	2	2	7M
	ii) State the minimum detectable signal (MDS) in radar systems, and how does it relate to receiver noise and signal-to-noise ratio (SNR)? Discuss the factors affecting MDS and calculate it based on a given noise figure and bandwidth of the receiver.	2	2	7M
3	OR			
	i) An L-band radar operates at a frequency of 1.5 MHz with an antenna gain of 36 dB. It is designed to achieve a minimum signal-to-noise ratio (SNR) of 20 dB, with a receiver bandwidth of 4 MHz, a radar cross section (RCS) of 100 m ² , a noise figure of 10 dB, and a maximum range of 120 km. Calculate the following: a) The minimum detectable signal (MDS) in watts. b) The peak power required for the radar to achieve the desired range. c) The pulse width of the radar signal in microseconds.	3	2	7M
	ii) Describe the operating principle of FM-CW radar and how it can be used to measure both range and Doppler shift. Provide a block diagram of an FM-CW radar system and describe the characteristics of approaching and receding targets. How does an FM-CW altimeter work, and what are common measurement errors associated with FM-CW radar?	2	2	7M
	Unit-III			
3	a i) Imagine you are designing a radar system for an automotive safety application. The Delphi ESR radar, used in modern vehicles, utilizes MTI and Pulse Doppler	2	3	7M

		principles to enhance collision avoidance systems. Describe how the Delphi ESR radar system applies MTI and Pulse Doppler principles to detect moving vehicles amidst stationary obstacles. Provide a block diagram of the radar system and explain the function of each component.			
		ii) Analyze an MTI radar with a pulse width of $2\text{ }\mu\text{s}$ and a PRF of 500Hz , compared to the Pulse-Doppler radar's ability to handle high-speed targets. Discuss which radar would be more effective for a fast-moving missile defense scenario.	4	3	7M
	OR				
	b	i) For the Delphi ESR operating at 24 GHz and detecting a vehicle moving at 50 km/h , calculate the Doppler shift. How does this Doppler shift help in differentiating the moving vehicle from stationary objects? ii) A Pulse Doppler radar system is tasked with detecting a fast-moving aircraft with a radar cross-section of 3 m^2 at a frequency of 10 GHz . The radar has a transmitted power of 2 kW , an antenna gain of 35 dB , a system loss of 15 dB , and a minimum detectable signal of $2 \times 10^{-10}\text{ W}$. Calculate Maximum range (R_{max}) with the following parameters. Transmitted power (P_t): 2 kW ; Antenna gain (G): 35 dB (or a linear gain of 3162); Frequency (f): 10 GHz (wavelength $\lambda = 0.03\text{ m}$); Target radar cross-section (σ): 3 m^2 ; System losses (L): 15 dB (or a linear loss factor of 31.62); Minimum detectable signal (S_{min}): $2 \times 10^{-10}\text{ W}$	4	3	7M
4	Unit-IV				
	a	i) State Search Radar and Tracking radar and give the advantage of Tracking radar over search radar.	2	4	7M
		ii) Given a radar system that is experiencing difficulties in tracking a high-speed, maneuvering target using Conical Scan, how to adjust the system's parameters or operational settings to improve tracking accuracy?		4	7M
	OR				
	b	i) With neat diagram explain the Conical Scan radar tracking technique and how it functions in tracking a moving target.	2	4	14 M
5	Unit-V				
	a	i) Explain the principle of beam steering in a phased array antenna. How does the phased array antenna achieve electronic beam steering without physically moving the antenna?	2	5	14 M
	OR				
	b	i) Explain the fundamental differences between series feeding and parallel feeding in phased array antennas. How does each feeding method impact the distribution of power to the antenna elements? ii) For a phased array antenna with a total of 64 elements arranged in a square grid, calculate the approximate half-power beam width if the element spacing is 0.5 wavelengths. Use the approximation that the beam width (in degrees) is roughly 70 , where N is the number of elements.	4	5	7M
			3	5	7M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20EC4111

EDGE COMPUTING

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
1	Unit-I			
	a i) Discuss the impact of Edge Computing on Industrial automation and IoT.	4	1	7M
	ii) How does the data processing location differ between Edge and Fog Computing?	3	1	7M
	OR			
	b i) What is the Machine-to Machine(M2M) communication model?	4	1	7M
	ii) Describe the role of 5G and IoT protocols in Edge and Fog Computing communication models.	3	1	7M
2	Unit-II			
	a i) Discuss the major benefits of using IoT in palliative care	4	2	7M
	ii) How can retrospective analysis improve future IoT implementations?	4	2	7M
	OR			
	b i) What factors should an architect consider when designing an IoT solution?	3	2	7M
	ii) How does an industrial IoT (IIoT) implementation differ from consumer IoT?	3	2	7M
3	Unit-III			
	a i) Construct the Design of Smart home with Raspberry Pi and other hardware devices with neat sketch.	4	2	7M
	ii) What command is used to connect to Raspberry Pi via SSH from a Linux system?	3	3	7M
	OR			
	b i) How can you access a Raspberry Pi web server from another device?	3	3	7M
	ii) Write a Python script to capture an image and display it using OpenCV	3	3	7M
4	Unit-IV			
	a i) Describe the role of I2C, SPI, and UART in Raspberry Pi device interfacing.	3	4	7M
	ii) What is the significance of QoS (Quality of Service) in MQTT communication?	4	3	7M
	OR			
	b i) Describe the role of MQTT broker in the communication process.	3	3	7M
	ii) Describe the process of handling QoS levels in MQTT 3.1.1.	4	4	7M
5	Unit-V			
	a i) How can Raspberry Pi be integrated with sensors for industrial edge applications?	4	4	7M
	ii) What are the key differences between industrial and commercial IoT applications?	4	4	7M
	OR			
	b i) What are the storage options available in Raspberry Pi for edge computing applications?	4	4	7M
	ii) Describe the importance of containerization and virtualization in edge computing.	3	4	7M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CS4108

MOBILE ADHOC AND SENSOR NETWORKS

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
1	Unit-I			
	a i) Explain the different application and characteristics of MANETs compared to traditional networking systems?	KL2	CO1	7M
	ii) Describe DSR protocol with neat sketch	KL1	CO1	7M
	OR			
	b i) Illustrate the differences between topology-based and position-based routing approaches in MANETs.	KL3	CO1	7M
	ii) Identify and discuss the primary challenges faced by MANETs.	KL4	CO1	7M
2	Unit-II			
	a i) Evaluate the effectiveness of TCP over MANETs by analyzing the trade-offs involved in implementing various TCP enhancements.	KL3	CO2	7M
	ii) What is the Transmission Control Protocol (TCP)? Provide an overview of its key features and functions in traditional network environments.	KL2	CO2	7M
	OR			
	b i) Explain at least two specific solutions proposed to enhance TCP performance in MANETs.	KL1	CO2	14M
3	Unit-III			
	a i) What are the advantages and disadvantages of using clustering? How does clustering influence network performance and energy efficiency?	KL1	CO3	7M
	ii) Discuss the importance of energy consumption in the design of wireless sensor networks.	KL3	CO3	7M
	OR			
	b i) Explain the concepts of sensing and communication range in wireless sensor networks.	KL2	CO3	7M
	ii) Define wireless sensor networks (WSNs) and What are the key characteristics that differentiate them from traditional wired networks?	KL1	CO3	7M
4	Unit-IV			
	a i) Analyze STEM MAC protocol in detail	KL4	CO4	7M
	ii) Explain the Directed diffusion routing in detail	KL2	CO4	7M
	OR			
	b i) Describe how high-level application layer support can enhance data retrieval in sensor networks.	KL3	CO4	7M
	ii) Discuss the importance of the routing layer in sensor networks.	KL1	CO4	7M

5	Unit-V				
	a	i) Compare and contrast the integrated architectures of MANETs, WLANs, and cellular networks.	KL2	CO5	7M
		ii) List the key components of Mobile Ad Hoc Networks (MANETs), Wireless Local Area Networks (WLANs), and cellular networks. What distinguishes each of these types of networks from one another?	KL1	CO5	7M
	OR				
	b	i) Explain the protocol stack used in integrated networks of MANETs, WLANs, and cellular networks.	KL1	CO5	7M
		ii) Discuss the concept of a heterogeneous architecture that integrates MANETs, WLANs, and cellular networks.	KL2	CO5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20AI4107

ARTIFICIAL NEURAL NETWORKS

Time: 3 hours

CSE (AI)

Max. Marks: 70

R20

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) Explain the similarities between a biological neural network (human brain) and an artificial neural network.	K2	CO1	7M
		ii) Explain the Hebbian learning rule. How does it differ from the Widrow-Hoff learning rule (delta rule)?	K3	CO1	7M
	OR				
	b	i) Explain how a neural network can be viewed as a directed graph. Describe two common network architectures in neural networks.	K3	CO2	7M
		ii) Outline the Boltzmann learning rule in neural networks. Why is it considered a stochastic (statistical) learning approach?	K4	CO2	7M
2	Unit-II				
	a	i) Define a perceptron. State the perceptron convergence theorem.	K2	C02	7M
		ii) Explain the relation between the perceptron classifier and the Bayes optimal classifier in a Gaussian environment.	K3	C02	7M
	OR				
	b	i) What is the XOR problem in the context of neural networks, and why is it significant? How does the backpropagation algorithm help solve this problem?	K4	CO3	7M
		ii) Describe the Least Mean Squares (LMS) learning algorithm. How can learning-rate annealing improve its convergence?	K4	C03	7M
3	Unit-III				
	a	i) What is generalization in the context of neural networks, and why is it important? How does cross-validation help in achieving good generalization?	K3	C03	7M
		ii) Explain the concept of network pruning in neural networks. Why might pruning improve a network's performance or generalization ability?	K4	C03	7M
	OR				
	b	i) Discuss the role of the Hessian matrix in neural network training. How can second-order methods that use the Hessian accelerate the convergence of learning?	K4	CO3	7M
		ii) Identify two limitations of the standard backpropagation learning algorithm. For each limitation, suggest a method to address it.	K4	C03	7M
4	Unit-IV				
	a	i) Explain the Self-Organizing Map (SOM) algorithm. How does an SOM learn to produce a topological feature map from input data?	K3	C03	7M
		ii) Describe any two important properties of the feature maps generated by a Self-Organizing Map.	K4	C03	7M
	OR				
	b	i) What is Learning Vector Quantization (LVQ)? Explain how an LVQ network learns to classify input patterns.	K4	C04	7M
		ii) Explain the concept of adaptive pattern classification in neural	K4	C04	7M

		networks. How do self-organizing models (like SOM or LVQ) achieve adaptive classification?			
5	Unit-V				
	a	i)What is a neurodynamical (dynamic) neural network ? How does it differ from a feedforward neural network? Give an example of a dynamic neural network.	K4	C04	7M
		ii)Define attractors in the context of neural network dynamics. How are attractors related to memory storage in recurrent networks?	K4	C04	7M
	OR				
	b	i)Explain the structure of a Hopfield network and how it stores patterns as memories. How does the network retrieve a stored pattern from a partial or noisy input?	K4	C04	7M
		ii)What is a Restricted Boltzmann Machine (RBM)? Describe its architecture and the basic principle of its learning process.	K4	C04	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20AM4108

DATA ANALYTICS & VISUALIZATION

Time: 3 hours

CSE (AIML)

Max. Marks: 70

R20

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) Explain the functionality of Series and DataFrame in Pandas.	K2	CO1	7M
	ii) What are measures of central tendency and dispersion? Explain their importance in data analytics with suitable examples.	K2	CO1	7M
	OR			
	b i) What are measures of dispersion? Apply any one method to analyse variability in data.	K3	CO1	7M
	ii) Define Data Analytics. Explain why data analytics is important in today's business and research environment.	K2	CO1	7M
2	Unit-II			
	a i) How does Logistic Regression differ from Linear Regression? Give one example.	K2	CO2	7M
	ii) Define Maximum Likelihood Estimation (MLE). Explain its importance in statistical modeling.	K1	CO2	7M
	OR			
	b i) Differentiate between one-way ANOVA and two-way ANOVA.	K3	CO2	7M
	ii) Apply the idea of Multiple Linear Regression to analyze the effect of multiple predictors on a single outcome.	K3	CO2	7M
3	Unit-III			
	a i) Draw and explain a bar chart and stacked bar chart. Where are they used?	K1	CO3	7M
	ii) Explain the use of histograms and frequency polygons in data analysis.	K2	CO3	7M
	OR			
	b i) What is a box plot? Apply it to explain how outliers are detected in a dataset.	K3	CO3	7M
	ii) How is a pie chart different from a bar chart? Provide one use case for each.	K3	CO3	7M
4	Unit-IV			
	a i) List any three commonly used data visualization tools and briefly explain their features.	K1	CO4	7M
	ii) Differentiate between scalar, point, and vector visualization techniques.	K2	CO4	7M
	OR			
	b i) A dataset of students' marks in five subjects is grouped using hierarchical clustering. Show how visualization can help in interpreting the clusters.	K3	CO4	7M
	ii) Explain how the results of K-means clustering can be visualized	K2	CO4	7M
5	Unit-V			
	a i) Explain the use of DAX Logical Functions with one example	K2	CO5	7M
	ii) Describe the concept of Time Intelligence functions in DAX. How are they applied in analysing trends?	K2	CO5	7M
	OR			
	b i) Explain how Statistical functions are applied in DAX.	K3	CO5	7M
	ii) What are Information functions in DAX? Explain with one suitable example.	K2	CO5	7M

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CY4102

CYBER CRIME INVESTIGATION & DIGITAL FORENSICS

R20

Time: 3 hours

(CY)

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) Explain the nature and scope of cybercrime.	K2	CO1	7M
	ii) Compare individual-targeted cybercrimes with property-targeted cybercrimes, highlighting their key impacts.	K3	CO1	7M
	OR			
	b i) Illustrate with an example how social engineering techniques exploit human behavior in committing cybercrimes.	K3	CO1	7M
	ii) Classify online financial fraud under relevant cybercrime categories with example.	K3	CO1	7M
2	Unit-II			
	a i) Explain with examples what is meant by software piracy and its impact on intellectual property.	K2	CO2	7M
	ii) Classify different types of white-collar cybercrimes and illustrate how they affect organizations.	K3	CO2	7M
	OR			
	b i) Define computer viruses and describe two common ways they spread across networks.	K1	CO2	7M
	ii) Evaluate legal measures to address online stalking and obscenity.	K4	CO2	7M
3	Unit-III			
	a i) Define digital evidence and explain why it is important in cybercrime investigation.	K1	CO3	7M
	ii) Analyze how encryption and decryption methods impact the investigation process in cybercrime cases.	K4	CO3	7M
	OR			
	b i) List any two tools used in cybercrime investigations and briefly describe their purpose.	K1	CO3	7M
	ii) Evaluate the challenges investigators face during search and seizure of computers in cybercrime cases.	K4	CO3	7M
4	Unit-IV			
	a i) Analyze the challenges investigators face when using audio and video forensic analysis in real-world cases.	K4	CO4	7M
	ii) Define digital forensics and state its primary objective in cybercrime investigation.	K1	CO4	7M
	OR			
	b i) List any two forensic technologies and describe their basic usage.	K2	CO4	7M
	ii) Evaluate the importance of fingerprint, face, and iris recognition in strengthening digital forensic investigations.	K4	CO4	7M

Unit-V				
5	a	i) Define digital evidence and explain why proper handling is necessary in legal proceedings.	K1	CO5 7M
		ii) Analyze the challenges of applying IPC and CrPC provisions to modern cybercrime cases.	K4	CO5 7M
	OR			
	b	i) List two legal policies related to cybercrime and briefly explain their purpose.	K2	CO5 7M
		ii) Analyze how gaps in existing cyber laws affect the enforcement of digital evidence controls.	K4	CO5 7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CY4106

CLOUD SECURITY

Time: 3 hours

(CY)

Max. Marks: 70

R20

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) Explain in detail the cloud service models: IaaS, PaaS, and SaaS. Compare them with suitable real-world applications.	K2	CO1	7M
	ii) What is cloud security? Explain why security is one of the biggest challenges in cloud adoption.	K2	CO1	7M
	OR			
	b i) Explain the types of cloud deployment models and compare their use cases.	K2	CO1	7M
	ii) Explain the CSA and NIST cloud reference models and their importance in cloud security.	K2	CO1	7M
2	Unit-II			
	a i) Define Cloud Security. Explain the major goals of cloud security such as confidentiality, integrity, and availability with examples.	K2	CO2	7M
	ii) What is infrastructure security in cloud computing? Explain the key security challenges at the network, host, and application levels.	K2	CO2	7M
	OR			
	b i) Explain the different security issues in cloud computing.	K2	CO2	7M
	ii) Explain IaaS, PaaS, SaaS application security with examples.	K3	CO2	7M
3	Unit-III			
	a i) Explain the different types of attack entities in cloud environments. Give examples for each.	K2	CO3	7M
	ii) Discuss the major network-level attack tools used by attackers. How can cloud providers defend against them?	K2	CO3	7M
	OR			
	b i) Describe the following attacks in cloud computing. Network-level attacks, VM-level attacks and Application-level attacks	K3	CO3	7M
	ii) Explain the taxonomy of cloud-based attacks. How does this classification help in securing systems?	K2	CO3	7M
4	Unit-IV			
	a i) Give an example of security attack in cloud computing and explain its impact.	K3	CO4	7M
	ii) Discuss various software security requirements in cloud-based systems.	K2	CO4	7M
	OR			
	b i) What are the cloud software security requirements? Discuss in detail authentication, authorization, data encryption, secure APIs, and compliance.	K2	CO4	7M
	ii) Discuss aspects of data security in cloud computing and methods for mitigation.	K4	CO4	7M
5	Unit-V			
	a i) What is identity authentication in cloud computing? Explain different techniques briefly.	K3	CO5	7M
	ii) Discuss the role of encryption keys in cloud security. Explain symmetric and asymmetric key encryption with examples.	K3	CO5	7M
	OR			

	b	i) Why is key management one of the most critical challenges in cloud security? Discuss different key management practices in detail.	K4	CO5	7M
		ii) What are the challenges of using standard security algorithms in cloud environments?	K3	CO5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20DS4103

DATA SCIENCE APPLICATIONS

Time: 3 hours

(DS)

Max. Marks: 70

R20

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) Differentiate between basic indexing and fancy indexing in Numpy with examples.	K4	1	7M
		ii) Demonstrate Boolean indexing in Numpy to extract all even numbers from an array of 1 to 20.	K3	1	7M
	OR				
	b	i) Describe the role of data scientist in the data science process with an example.	K2	1	7M
		ii) Create a numpy ndarray of integers from 1 to 12 and reshape it into 3*4 matrix.	K3	1	7M
2	Unit-II				
	a	i) How sorting and ranking is done in Pandas? Give examples.	K2	2	7M
		ii) Compare and contrast indexing and filtering in Pandas Data Frames with suitable examples.	K4	2	7M
	OR				
	b	i) Explain the architecture and features of the Pandas library. How is it useful in data analysis?	K2	2	7M
		ii) Write a code snippet to drop the row with index label 2 from a Data Frame.	K3	2	7M
3	Unit-III				
	a	i) Explain how JSON data can be read and converted in Panda Data Frame.	K2	3	7M
		ii) Describe how to read and write data in text format using Pandas.	K2	3	7M
	OR				
	b	i) Write a code snippet to read a CSV file named data.csv and display the first five rows.	K3	3	7M
		ii) Explain binary data formats like HDF5 and their advantages in data storage.	K2	3	7M
4	Unit-IV				
	a	i) What is data transformation? Explain with example.	K2	4	7M
		ii) Explain the difference between database-style merging and concatenation along an axis in Pandas.	K2	4	7M
	OR				
	b	i) Discuss how matplotlib and Pandas plotting functions can be used to visualize data with simple plots.	K2	4	7M
		ii) Compare and contrast line plots and scatter plots in terms of their suitability in data visualization.	K4	4	7M
5	Unit-V				
	a	i) What is the purpose of groupby () function in Pandas? Give example.	K2	5	7M
		ii) Write the Pandas Code snippet to group employee data by "Department", calculate average salary, and fill missing value by the mean value.	K4	5	7M

OR				
b	i) Analyze how the aggregate functions on grouped data helps in summarizing datasets.	K4	5	7M
	ii) Explain the split-apply-combine strategy in group operations with an example.	K2	5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CYHN01

WEB & DATABASE SECURITY

Time: 3 hours

(CY)

Max. Marks: 70

R20

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) Explain the role of risk analysis in web security	2	1	7M
	ii) Describe the main types of cryptographic systems used on the web	2	1	7M
	OR			
	b i) What legal and regulatory issues affect the use and distribution of cryptography? Explain	2	1	7M
	ii) Discuss the challenges and limitations of digital identification	2	1	7M
2	Unit-II			
	a i) Explain various techniques and tools used to protect user privacy on the web	2	2	7M
	ii) Analyze the importance of data backups and antitheft measures	4	2	7M
	OR			
	b i) What is the role of physical security in the protection of web infrastructure? Explain	2	2	6M
	ii) Define the following: system patching, secure configurations, anti-malware tools, and logging.	1	2	8M
3	Unit-III			
	a i) Explain the Access Control Models for XML	2	3	14M
	OR			
	b i) What are the key challenges in integrating trust management and trust negotiation with database security? Explain	2	3	7M
	ii) Analyze the security in data warehouses and OLAP systems	4	3	7M
	Unit-IV			
4	a i) Explain the concept of security re-engineering in database systems	2	4	7M
	ii) How does watermarking differ in structured data compared to multimedia content? Explain	2	4	7M
	OR			
	b i) What are Hippocratic databases and how do they integrate privacy principles directly into database design? Explain	2	4	14M
	Unit-V			
	a i) What are the limitations of traditional anonymization methods and how does a Bayesian perspective address these challenges?	2	5	14M
5	OR			
	b i) Explain how privacy-enhanced LBAC models aim to balance functionality and user privacy.	2	5	7M
	ii) Analyze the challenges of enforcing security and privacy policies in mobile environments	4	5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CY4112

DATA PRIVACY

Time: 3 hours

(CY)

Max. Marks: 70

R20

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) Define cryptography and list its main types.	K1	CO1	7M
	ii) Explain the role of cryptography in ensuring data security.	K2	CO1	7M
	OR			
	b i) What are common hardware and software vulnerabilities? Give two examples of each.	K1	CO1	7M
	ii) Describe how web security mechanisms protect against attacks like phishing or SQL injection.	K2	CO1	7M
2	Unit-II			
	a i) What is data localization? Explain the issues and challenges associated with data localization policies.	K2	CO2	7M
	ii) Explain how personally identifiable information and sensitive information are managed to ensure data privacy	K1	CO2	7M
	OR			
	b i) Explain the concept of data localization and why it is important for data privacy.	K2	CO2	7M
	ii) Apply basic steps to protect sensitive information in a small business database containing employee personal details.	K3	CO2	7M
3	Unit-III			
	a i) Compare the effectiveness of null map and wrong-map models in protecting privacy in a dataset.	K4	CO3	7M
	ii) What are the barriers to distribution in privacy-preserving data sharing? Explain with examples	K3	CO3	7M
	OR			
	b i) A hospital wants to release patient data for research. Apply null map protection to safeguard sensitive entries.	K3	CO3	7M
	ii) Explain the differences between null map, k-map, and wrong-map protection models.	K2	CO3	7M
4	Unit-IV			
	a i) Define data explosion and list its main challenges in modern computing systems.	K1	CO4	7M
	ii) Describe the role of sharing practices and policies in managing privacy and data risks.	K2	CO4	7M
	OR			
	b i) What is meant by the trade-off between data availability, storage, and collection?	K1	CO4C	7M
	ii) Explain why mathematical models are used to measure privacy risks in large datasets.	K2	CO4	7M
5	Unit-V			
	a i) Compare the risks of data profiling versus direct data collection in terms of privacy violations.	K4	CO5	7M
	ii) Describe how data linking can compromise individual privacy.	K2	CO5	7M
	OR			
	b i) Explain how demographic information can increase privacy risks in datasets.	K2	CO5	7M
	ii) What is meant by uniqueness in a dataset? Give an example.	K1	CO5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CCMN38

DEVOPS

(EEE & ECE)

Max. Marks: 70

Time: 3 hours

R20

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) Explain the phases of the Software Development Life Cycle (SDLC) and how they contribute to the overall software development process.	2	1	14M
	OR			
	b i) Describe the core values and principles of Agile Software Development. How do these values shape the way software is developed? ii) Compare and contrast the Waterfall model with Agile development methodology.	2 2	1 1	7M 7M
2	Unit-II			
	a i) Explain the architecture of a DevOps system ii) What is the need for DevOps in modern software development, and how does it address the limitations of traditional development practices?	2 2	2 2	7M 7M
	OR			
	b i) Define the concept of deployments in the context of DevOps. What are the different deployment strategies, and when should each be used? ii) What is a DevOps delivery pipeline, and how does it facilitate continuous delivery? Explain each stage of a typical DevOps pipeline	2 2	2 2	7M 7M
3	Unit-III			
	a i) What are the key technology aspects to consider when adopting DevOps in a project? Explain ii) How do Agile capabilities influence DevOps adoption in projects? Discuss the intersection of Agile and DevOps principles.	2 2	3 3	7M 7M
	OR			
	b i) Describe the tool stack implementation in a DevOps project. ii) Explain the people aspect of DevOps adoption in a project.	2 2	3 3	7M 7M
4	Unit-IV			
	a i) Compare and Contrast Continuous Integration (CI) and Continuous Delivery (CD) ii) What are the key stages of a Continuous Integration/Continuous Delivery (CI/CD) pipeline? Explain each stage and how it contributes to software delivery.	4 2	4 4	7M 7M
	OR			
	b i) Explain Continuous Deployment and how it extends Continuous Delivery ii) What are the benefits of implementing Continuous Integration (CI) and Continuous Delivery (CD) in software development projects? Explain	2 2	4 4	7M 7M
5	Unit-V			
	a i) What is the DevOps Maturity Model? Explain its key factors ii) What are the stages of the DevOps Maturity Model? Describe each stage	2 2	5 5	7M 7M
	OR			
	b i) Discuss the process of assessing an organization's DevOps maturity and the criteria used to evaluate maturity levels. ii) Discuss the key factors that influence an organization's DevOps maturity.	2 2	5 5	7M 7M

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CEHN04

Theory of Elasticity and Plasticity

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
1	Unit-I			
	a i) Derive expressions for stress at a point.	K1	1	7M
	ii) State and explain the generalized Hooke's Law	K2	1	7M
	OR			
	b i) What are the boundary conditions in terms of stresses?	K1	1	7M
	ii) What is the concept of compatibility? What are the compatibility conditions?	K2	1	7M
2	Unit-II			
	a i) Express the stress compatibility equation for plane strain case.	K1	2	7M
	ii) Explain plane Stress and plane strain problem with applications?	K2	2	7M
	OR			
	b With the origin at the center of the free end of cantilever beam derive the expressions of stresses when the point load is acting at the free end using stress function	K3	2	14 M
3	Unit-III			
	a i) Derive strain-displacement relation in polar co-ordinate system.	K1	3	7M
	ii) Explain the effect of circular holes on stress?	K2	3	7M
	OR			
	b i) Explain the rotating disks of uniform thickness ?	K1	3	7M
	ii) Explain the Equations of equilibrium in polar co-ordinates in terms of displacements?	K2	3	7M
4	Unit-IV			
	a i) Explain the analogy of Torsion ?	K1	4	7M
	ii Explain about twisting of rectangular bars.	K2	4	7M
	OR			
	Obtain expression for torque and angle of twist of an elliptical shaft subjected to uniform torsion and draw contour lines for the wrapped cross section?.	K3	4	14 M
5	Unit-V			
	a i) What is the equation for the Tresca criteria?	K1	5	7M
	ii) Write about Plastic potential and Plastic flow in detailed.	K2	5	7M
	OR			
	b i) What is the Von Mises yield criterion? Describe it in detail?	K1	5	7M
	ii) What is the Levi Mises equation? What is the formula for equivalent plastic strain?	K2	5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CSHN05

COMPUTER VISION

Time: 3 hours

Max. Marks: 70

R20

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) Describe Fourier Transforms in detail.	K2	CO1	7M
	ii) Provide a model for describing image color.	K3	CO1	7M
	OR			
	b i) Explain about photometric stereo.	K1	CO1	7M
	ii) Discuss about different types of linear filters.	K2	CO1	7M
2	Unit-II			
	a i) Discuss the different types of edge detection algorithms.	K2	CO2	7M
	ii) Discuss the use of multiple cameras to combine views.	K2	CO2	7M
	OR			
	b i) What are the advantages and disadvantages of each type of edge detection algorithm?	K1	CO2	7M
	ii) What is the process of synthesizing textures for rendering?	K4	CO2	7M
3	Unit-III			
	a i) Discuss about accurate center location by using Hough transform	K3	CO3	7M
	ii) How do you do segmentation by using Graph-Theoretic Clustering	K2	CO3	7M
	OR			
	b i) Distinguish Hough Transform and generalized Hough transform.	K4	CO3	7M
	ii) Describe the problem of missing data in segmentation.	K1	CO3	7M
4	Unit-IV			
	a i) Explain two common techniques used for obtaining hypotheses related to pose estimation.	K2	CO4	7M
	ii) How can probabilistic methods be used to fit geometric models to images, such as lines and circles?	K3	CO4	7M
	OR			
	b i) Explain the EM algorithm.	K1	CO4	7M
	ii) How can probabilistic methods be used to develop new segmentation and fitting algorithms that are more robust and accurate?	K4	CO4	7M
5	Unit-V			
	a i) Describe the application of computer vision in health care with an appropriate example.	K3	CO5	7M
	ii) Discuss the geometric templates from spatial relations.	K1	CO5	7M
	OR			
	b i) Write a short essay on the applications of computer vision in the real world.	K3	CO5	7M
	ii) Discuss the different types of object detection algorithms.	K1	CO5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20CSHN06 NATURAL LANGUAGE PROCESSING

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
1	Unit-I			
	a i) Explain the different phases of NLP with examples	2	1	7M
	ii) Analyse the challenges and ambiguities in NLP.	3	1	7M
	OR			
	b i) Illustrate about the Noisy Channel Model and its role in spelling error correction.	2	1	7M
	ii) Explain about Formal Grammar of English with respect to NLP.	2	1	7M
2	Unit-II			
	a i) Explain the basic techniques used for smoothing in N-gram models.	2	2	7M
	ii) Discuss the basics of neural networks and their role in language modeling.	2	2	7M
	OR			
	b Explain about the sequence of steps for training data part in NLP and its importance.	2	2	7M
	ii) Explain the application of neural language models in NLP system development.	2	2	7M
3	Unit-III			
	a i) Explain the concept of Parts-of-Speech tagging and different Tagsets used.	2	3	7M
	ii) Explain about the rule-based and transformation-based learning approaches for POS tagging.	2	3	7M
	OR			
	b i) Explain about POS tagging using HMM	2	3	7M
	ii) Explain the introduction of neural models for POS tagging.	2	3	7M
4	Unit-IV			
	a i) Illustrate about the Probabilistic CKY Parsing algorithm for PCFGs.	2	4	7M
	ii) Explain top-down and bottom-up parsing techniques with examples.	2	4	7M
	OR			
	b i) Explain about treebanks and their significance in syntactic parsing	2	4	7M
	ii) Explain Probabilistic Context-Free Grammar (PCFG) with an example.	2	4	7M
5	Unit-V			
	a i) Illustrate about the concept of Word Sense and introduce WordNet.	2	5	7M
	ii) Explain the concept of Vector Semantics and how words are represented as vectors.	2	5	7M
	OR			
	b i) Explain the Skip-gram and CBOW models used for word embeddings.	2	5	7M
	ii) Explain about the process of measuring similarity using vector semantics.	2	5	7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20AMHN05

KNOWLEDGE REPRESENTATION & REASONING

Time: 3 hours

CSE (AIML)

Max. Marks: 70

R20

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) Explain the importance of Knowledge Representation and Reasoning (KRR) in artificial intelligence. Discuss why KRR is essential for intelligent system	2	1	7M
	ii) Describe various types of logic used in knowledge representation. Explain their characteristics and applications.	2	1	7M
	OR			
	b i) Discuss the historical development of logic. How did these developments influence modern AI reasoning systems?	2	1	7M
	ii) Explain how different logics share common principles and differ in their measures and types	2	1	7M
2	Unit-II			
	a i) Define ontology in knowledge representation. Explain different ontological categories with examples.	2	2	7M
	ii) Discuss the philosophical foundations of ontology. How do philosophical ideas influence ontological modeling?	2	2	7M
	OR			
	b i) Explain top-level categories in ontology. Describe how they help in organizing knowledge of physical and abstract entities.	2	2	7M
	ii) Describe how space and time are represented as ontological concepts with examples of sets, collections, types, and categories.	2	2	7M
3	Unit-III			
	a i) Explain natural language semantics and the different levels of knowledge representation with examples.	2	3	7M
	ii) Explain the role of knowledge engineering in building knowledge-based systems with clear steps	2	3	7M
	OR			
	b i) Compare rule-based knowledge representation with object-oriented systems.	2	3	7M
	ii) Describe frame-based knowledge representation. Explain how structure and relationships are represented in frames.	2	3	7M
4	Unit-IV			
	a i) What is constraint satisfaction? Explain how these are used in representing change and problem solving.	2	4	7M
	ii) Describe the syntax and semantics of contexts. Explain first-order and modal reasoning within contexts.	2	4	7M
	OR			
	b i) Discuss concurrent processes and their role in computation along with suitable examples.	2	4	7M
	ii) Explain the classification of processes in knowledge representation which include time, events, histories, and procedures.	2	4	7M

Unit-V				
5	a	i) Discuss vagueness, uncertainty, randomness, and ignorance in knowledge representation. Explain how they affect reasoning.	2	5 7M
		ii) Describe theories, models, and the real world in the context of knowledge representation.	2	5 7M
	OR			
	b	i) Explain the limitations of traditional logic. How do fuzzy logic and nonmonotonic logic address these limitations?	2	5 7M
		ii) Discuss the process of ontologies, conceptual schema, and tools used for knowledge acquisition.	2	5 7M

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

IV B.Tech I Semester Regular Examinations, November-2025

Sub Code: R20DSHN01

IMAGE AND VIDEO ANALYTICS

Time: 3 hours

(DS)

Max. Marks: 70

R20

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

Q.No	Questions	KL	CO	M
Unit-I				
1	a Explain the process of digital image representation. Discuss the relationship between image intensity, pixel position, and gray levels with suitable examples.	K3	CO1	7M
	Discuss the mathematical tools used in digital image processing.	K3	CO1	7M
	OR			
	b Write short notes on vector and matrix operations used in digital image processing.	K3	CO1	7M
	Compare and contrast different image transforms such as DFT, DCT.	K3	CO1	7M
Unit-II				
2	a Describe various edge detection techniques used in digital image processing.	K3	CO2	7M
	Describe basic statistical models of images. How do these models help in analyzing and processing images?	K3	CO2	7M
	OR			
	b Explain the concept of histograms in image processing.	K3	CO2	7M
	How are histograms used for image enhancement? Discuss with an example.	K3	CO2	7M
Unit-III				
3	a Explain different colour models used in digital image processing. Discuss RGB, CMY, and HSV models with neat diagrams and their applications.	K4	CO3	7M
	Describe colour transformations in image processing. How are these transformations useful for image enhancement and analysis?	K4	CO3	7M
	OR			
	b What is image and video denoising? Describe the methods used to remove noise while preserving important details in the image/video.	K4	CO3	7M
	Discuss various image and video enhancement techniques. Explain how contrast enhancement and filtering improve visual quality.	K4	CO3	7M
Unit-IV				
4	a Explain the process of object detection in images and videos. Discuss various techniques used for detecting objects in different environments.	K3	CO5	7M
	Write short notes on challenges in object detection, recognition, and tracking. Suggest possible solutions or methods to overcome these challenges.	K3	CO4	7M
	OR			

	b	Explain different methods used for object tracking in videos. Compare correlation-based and feature-based tracking techniques.	K3	CO4	7M
		Discuss recognition techniques used in cluttered or noisy environments. How are they applied in security or surveillance systems?	K3	CO4	7M
5	Unit-V				
	a	Explain IoT-based video analytics architectures.	K3	CO5	7M
		Discuss how video analytics is integrated with Wireless Sensor Networks (WSN) for real-time monitoring and decision-making.	K3	CO5	7M
	OR				
	b	Explain the applications of image and video analytics in industrial sectors. Discuss how automation and quality inspection benefit from visual data analysis	K3	CO5	7M
		Explain the use of remote sensing in image and video analytics. Discuss how satellite images are processed for environmental and geographical studies	K3	CO5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20IT4107

BLOCK CHAIN TECHNOLOGIES

Time: 3 hours

(IT)

Max. Marks: 70

R20

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) Explain the birth of blockchain technology.	2	1	7M
		ii) Identify the key business benefits of Blockchain.	2	1	7M
	OR				
	b	i) Illustrate blockchain technology with an example.	2	1	7M
		ii) Explain the scenario about Building trust with Blockchain.	2	1	7M
2	Unit-II				
	a	i) What Makes a Blockchain Suitable for Business? Explain.	2	2	7M
		ii) Explain about Shared ledger and Permissions in Blockchain technology with an example.	2	2	7M
	OR				
	b	i) Explain about Permissions in Blockchain technology with an example.	2	2	7M
		ii) Identifying Participants and their Roles in Blockchain.	2	2	7M
3	Unit-III				
	a	i) Elaborate the different types of frictions in market.	2	3	7M
		ii) Discuss about Transforming Ecosystems through Increased Visibility.	2	3	7M
	OR				
	b	i) Explain about Easing innovation friction.	2	3	7M
		ii) Illustrate about moving closer to Friction-Free Business Networks.	2	3	7M
4	Unit-IV				
	a	i) Explain about Trade finance use case.	2	4	7M
		ii) Explain about Supply Chain Management.	2	4	7M
	OR				
	b	i) Illustrate the Cross-border transactions.	2	4	7M
		ii) Explain about Electronic medical records Healthcare payments preauthorization.	2	4	7M
5	Unit-V				
	a	i) Explain about Hyperledger vision.	2	5	7M
		ii) Illustrate about Protection from attackers using Blockchain.	2	5	7M
	OR				
	b	i) Explain about Hyperledger fabric vision.	2	5	7M
		ii) Explain about cloud and development platform with respect to Blockchain.	2	5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC3OE03 CONCEPT OF SMART GRID TECHNOLOGY

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
1	Unit-I			
	a i) Assess the importance of the smart grid and explain the functions of smart grid.	K5	1	7M
	ii) Examine both the opportunities and the barriers associated with the implementation of smart grid technology.	K5	1	7M
	OR			
	b i) Define smart grid. Compare and contrast the conventional grid with the smart grid.	K4	1	7M
	ii) Explain the concepts of resilience and self-healing in the context of a smart grid.	K2	1	7M
2	Unit-II			
	a i) What is Automatic Meter Reading (AMR), and how does it streamline the process of collecting energy usage data?	K2	2	7M
	ii) Analyse the benefits and challenges of using smart appliances in a smart grid setup.	K4	2	7M
	OR			
	b i) Assess the concept of Vehicle-to-Grid (V2G) technology. How can V2G contribute to grid stability?	K5	2	7M
	ii) Explain the purpose and function of Phase Shifting Transformers in the smart grid.	K4	2	7M
3	Unit-III			
	a i) What are Intelligent Electronic Devices (IEDs), and how do they support monitoring and protection in smart grids?	K2	3	7M
	ii) Assess the importance of Phase Measurement Units (PMUs) in the smart grid.	K5	3	7M
	OR			
	b i) Describe how Wide Area Measurement Systems (WAMS) function and how they improve grid stability and fault management.	K3	3	7M
	ii) Explain any two smart storage options with their advantages and limitations.	K4	3	7M
4	Unit-IV			
	a i) Define a microgrid and evaluate the challenges of interconnecting microgrids with the main grid.	K5	4	7M
	ii) Assess the potential of thin-film solar cells for large-scale renewable energy production.	K5	4	7M
	OR			
	b i) Explain how variable-speed wind generators work and describe their advantages over fixed-speed generators.	K3	4	7M
	ii) Compare the uses and efficiencies of fuel cells and micro turbines as distributed energy resources.	K4	4	7M
5	Unit-V			
	a i) Define power quality and explain the power quality issues that arise with grid-connected renewable energy sources.	K4	5	7M
	ii) Describe how web-based power quality monitoring works in a smart grid environment.	K3	5	7M
	OR			
	b i) Evaluate the role of Advanced Metering Infrastructure (AMI) in enhancing power quality and reliability.	K5	5	7M
	ii) Describe the purpose and functionality of a neighbourhood Area Network (NAN) in a smart grid.	K2	5	7M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC3OE05

AUTOMOTIVE VEHICLES

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) Define the terms Chassis, Frame & Body	K2	CO1	7M
	ii) Write the functions of the following engine components (i) Piston (ii) Connecting rod (iii) Cylinder	K2	CO1	7M
	OR			
	b i) Explain the construction of various frames used in automobiles with neat sketch	K3	CO1	7M
	ii) What you meant by Integrated body construction	K2	CO1	7M
2	Unit-II			
	a i) Explain in detail with neat sketches about Hotchkiss drive and torque tube drive	K3	CO2	7M
	ii) Illustrate the operation of sliding mesh gearbox	K2	CO2	7M
	OR			
	b i) Explain the working of Universal Joint.	K2	CO2	7M
	ii) Explain the working principle of single plate clutch with neat sketch.	K4	CO2	7M
3	Unit-III			
	a i) What is front axle? Write its functions and explain the types of front axles	K2	CO3	7M
	ii) Define toe-in and toe-out. Sketch and explain steering mechanism.	K3	CO3	7M
	OR			
	b i) Sketch and explain steering mechanism. Deduce an expression for true rolling of a steering wheel.	K2	CO3	7M
	ii) Explain the wheel alignment, factors of wheel alignment and factors pertaining to wheels with neat sketch	K2	CO3	7M
4	Unit-IV			
	a i) Explain in detail about suspension system with neat sketches.	K2	CO4	7M
	ii) Explain the construction and working of mechanical brakes with a neat sketch.	K4	CO4	7M
	OR			
	b i) Write the principle of Braking and co efficient of friction.	K2	CO4	7M
	ii) What is anti-lock braking system? Explain the need and functioning of ABS with a sketch.	K2	CO4	7M
5	Unit-V			
	a i) Explain about Charging circuit, Starting system in an automobile	K2	CO5	7M
	ii) Discuss the working of battery and starting systems with neat circuit diagram.	K3	CO5	7M
	OR			
	b i) Explain the function and working of following electrical system. (a) Horn (b) Wiper (c) Fuel gauge	K3	CO5	7M
	ii) Describe the mechanism of solenoid switch with neat sketch	K2	CO5	7M

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

Q.No	Questions	KL	CO	M
1	Unit-I a) State Moore's Law and its original prediction regarding the growth of transistors on integrated circuits.	1	1	7M
	ii) Discuss in detail about the development milestones in microfabrication and electronic industry.	2	1	7M
2	OR a) Explain the concept of atomic bonding with necessary diagrams.	2	1	7M
	ii) Demonstrate with examples how nanoscale effects enhance the performance of materials in nanotechnology applications.	3	1	7M
3	Unit-II a) Illustrate how Transmission Electron Microscopy is used to study the structure of materials at the atomic level, providing specific examples of its applications in materials science and biology.	3	2	7M
	ii) Differentiate between Bulk and Surface Diffraction techniques.	4	2	7M
4	OR a) Explain the working principle of Molecular Beam Epitaxy (MBE) and describe the role of ultra-high vacuum, molecular beams, and substrate interaction, with supporting diagrams.	2	2	7M
	ii) Explain how precipitation affects the size, shape, and optical properties of quantum dots.	2	2	7M
5	Unit-III a) Examine the epitaxial growth of quantum wells its different types with neat diagrams.	4	3	7M
	ii) Classify the various types of etching techniques in detail.	3	3	7M
6	OR a) How to synthesize colloidal Quantum dots using e-beam lithography? Explain.	2	3	7M
	ii) Assess the advantages, challenges, and limitations of various self-assembly techniques in real-world applications like drug delivery, nanoelectronics, and photonics.	5	3	7M
7	Unit-IV a) What are carbon nanotubes? Explain about carbon arc method used to develop carbon nanotubes.	2	4	7M
	ii) Illustrate how the unique properties of CNTs influence their applications in various industries.	3	4	7M
8	OR a) Assess the impact of phonon interactions on the vibrational and electronic properties of CNTs.	5	4	7M
	ii) Propose a new application for CNTs in a field that has not yet widely adopted to existing technologies.	6	4	7M
9	Unit-V a) Demonstrate the application of physical property-based sensors in industries such as healthcare, automotive, and aerospace.	3	5	7M
	ii) Explain about future advancements of smart dust sensor with necessary diagrams.	2	5	7M

- Compare and contrast the fabrication techniques, advantages, and challenges of MEMS and NEMS.
- Design an innovative system that integrates single-photon sources and biological tagging for a novel biomedical or quantum technology application, illustrating the concept with a detailed sketch.

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CC3OE11

DIGITAL MARKETING

Time: 3 hours

(Common to CSE, IT& AI)

Max. Marks: 70

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

R20

Q.No	Questions	KL	CO	M
1	Unit-I			
	a i) Explain Digital marketing models in detail.	K3	CO1	7M
	ii) Discuss Digital marketing strategies implemented for apparel brand.	K3	CO1	7M
	OR			
	b i) Summarize the Evolution of Digital Marketing from traditional business in India.	K3	CO1	7M
	ii) Discuss the Drivers of the new marketing environment.	K3	CO2	7M
2	Unit-II			
	a i) Describe the Opportunities and challenges in Digital Marketing.	K2	CO2	7M
	ii) Explain Digital Consumer Buying Models.	K2	CO2	7M
	OR			
	b i) Assess how YouTube marketing has revolutionized in India with relevant example.	K3	CO2	7M
	ii) Evaluate Search Engine Advertising for mobile brand.	K5	CO3	7M
3	Unit-III			
	a i) Explain a successful social media marketing strategy for online food delivery app.	K5	CO3	7M
	ii) Analyze the role of social media platforms in digital marketing with example.	K3	CO4	7M
	OR			
	b i) Discuss the importance of LinkedIn Marketing and Facebook marketing for an educational Institute.	K3	CO2	7M
	ii) Explain how businesses will do the lead generation through LinkedIn and social media platforms for their marketing activities with example.	K4	CO3	7M
4	Unit-IV			
	a i) Describe the role of Mobile Advertising Analytics in digital marketing.	K5	CO4	7M
	ii) Judge how Twitter Advertising Campaigns helps in promoting a movie.	K3	CO4	7M
	OR			
	b i) Assess the usage of Instagram and Snapchat by GEN Z and its impact on Digital Marketing.	K5	CO4	7M
	ii) Explain the role of Mobile Campaign Development for an amusement park.	K4	CO3	7M
5	Unit-V			
	a i) Illustrate Google Analytics & Google AdWords in Digital Marketing with example.	K3	CO4	7M
	ii) Assess the importance of On-page and off-page optimization in Digital Marketing.	K5	CO5	7M
	OR			
	b i) Explain about Search engine and its working pattern in promoting a hotel.	K4	CO3	7M
	ii) Discuss the role of SEM and Web Analytics in Digital Marketing.	K5	CO4	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CC3OE14

SERVICES MARKETING

Time: 3 hours

(ME & CE)

Max. Marks 70

R20

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) Explain the nature of services and how they differ from physical goods.	K1	1	7M
	ii) Discuss the importance of the services sector in the global economy.	K2	1	7M
	OR			
	b i) Describe the key characteristics of services marketing.	K3	1	7M
	ii) Explain the characteristics influence marketing strategies.	K1	1	7M
2	Unit-II			
	a i) Explain the concept of relationship marketing and discuss its importance in the service industry.	K1	2	7M
	ii) Describe the unique characteristics of service consumption compared to product consumption.	K3	2	7M
	OR			
	b i) Discuss the relationship between customer satisfaction and customer loyalty in the service industry.	K2	2	7M
	ii) Describe some customer retention strategies used in services marketing.	K3	2	7M
3	Unit-III			
	a i) Discuss how market segmentation helps service companies understand their customers better	K2	3	7M
	ii) Discuss how customer needs, profitability, and strategic fit influence this decision.	K2	3	7M
	OR			
	b i) Identify the critical stages involved from concept development to commercialization?	K3	3	7M
	ii) Identify & List the challenges of pricing services.	K3	3	7M
4	Unit-IV			
	a i) Discuss the role of marketing communication in promoting services.	K2	4	7M
	ii) Explain the key steps involved in planning and managing service delivery.	K2	4	7M
	OR			
	b i) Analyze the importance of aligning service delivery systems with customer expectations.	K3	4	7M
	ii) Discuss the benefits and challenges of using intermediaries in service industries.	K2	4	7M
5	Unit-V			
	a i) Explain the role of word-of-mouth communication in external marketing	K2	5	7M
	ii) Describe the different types of word-of-mouth communication and discuss their impact on brand perception.	K3	5	7M
	OR			
	b i) Define "Moments of Truth" in service marketing and explain	K2	5	7M
	ii) Discuss the role of social media in facilitating word-of-mouth marketing	K2	5	7M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CC4OE02 CONSTRUCTION TECHNOLOGY AND MANAGEMENT

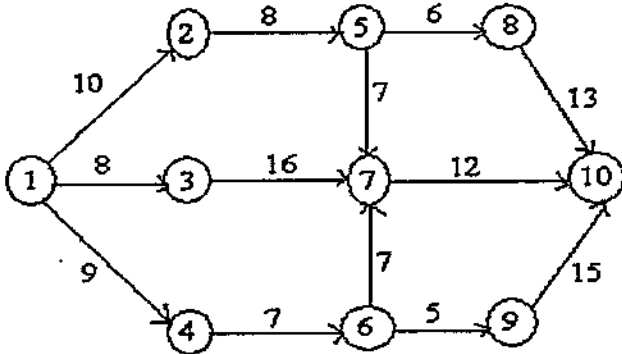
Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All FIVE Questions.

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

Q.No	Questions	KL	CO	M
1	Unit-I			
	a i) Discuss in detail about the scheduling and monitoring.	K1	1	7M
	ii) Bring out the differences between bar chart and mile stone chart.	K2	1	7M
	OR			
	b i) Describe the stages and types of planning in construction management.	K1	1	7M
	ii) Explain in detail about the events and activities.	K2	1	7M
2	Unit-II			
	a i) Determine the early start and late start in respect of all node points and identify critical path for the network shown in Fig.1.	K4	2	7M
	 Fig.1			
	ii) Write about the cost-duration analysis	K2	2	7M
	OR			
	b i) Show the differences between Critical Path Method and PERT technique	K2	2	7M
	ii) How to optimize the cost through networks?	K2	2	7M
3	Unit-III			
	a i) Explain about project budget flow statement.	K2	3	7M
	ii) write about Earnest money and Security Deposits	K1	3	7M
	OR			
	b i) What are the various costs involved in Time – Cost analysis? Explain each in detail.	K2	3	7M
	ii) What is contract? How do you prepare contract document?	K1	3	7M
4	Unit-IV			
	a i) Discuss the purpose of NBC code book-2016.	K1	4	7M
	ii) How to optimize the time and resources when there is time constraint?	K2	4	7M
	OR			
	b i) Write short notes on the following: a) Resource smoothing b.)Resource leveling	K2	4	7M
	ii) Explain the importance of Resource Management in the Construction of a Project.	K2	4	7M

5	Unit-V				
	a	i) What are the quality assurance techniques?	K1	5	7M
		ii) Briefly discuss about accident prevention program and what is the immediate attention in case of accident?	K2	5	7M
	OR				
	b	i) What are the approaches to improve safety in construction?	K1	5	7M
		ii) Define TQM (Total Quality Management) as per ISO – 9000.	K1	5	7M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC4OE03 NON-CONVENTIONAL ENERGY RESOURCES

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
1	Unit-I			
	a Explain why it is necessary to develop non-conventional methods of generating electrical energy?	2	1	14M
	OR			
	b Discuss the following i) Solar ponds ii) solar heating iii) Photo Voltaic energy conversion	2	1	14M
2	Unit-II			
	a i) Explain the principles of wind energy conversion?	2	2	7M
	ii) What are the concepts of WECS?	2	2	7M
	OR			
	b What are the different methods for obtaining energy from biomass? Explain	2	2	14M
3	Unit-III			
	a i) What is geothermal power? Discuss very briefly historical development of this form of energy?	2	3	7M
	ii) Explain the principle of Tidal power?	2	3	7M
	OR			
	b i) What are the components of tidal power plants?	2	3	7M
4	ii) Explain the advantages and disadvantages of wave energy?	2	3	7M
	Unit-IV			
	a i) Explain the principle of Thermo electric generation?	2	4	7M
	ii) Write about See-back, Peltier, Thomson effects?	3	4	7M
	OR			
	b i) Write the procedure to be followed for the selection of thermos electric materials?	3	4	7M
5	ii) What are the advantages of thermos electric power generation?	2	4	7M
	Unit-V			
	a i) Explain the basic principle of MHD power generation?	2	5	7M
	ii) Discuss the open cycle and closed cycle in MHD systems?	3	5	7M
	OR			
	b Briefly explain the international status of MHD power generation and its future prospects?	3	5	14M

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

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

Sub Code: R20CC4OE06

MECHATRONICS

Time: 3 hours

(ME)

Max. Marks: 70

R20

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) Explain the Concept of Mechatronics System Modeling and Its Importance in Design.	3	1	14M
	OR			
	b i) Describe the Process of Modeling a Mechatronics System Using the Mechanical and Electrical Domains	2	1	14M
2	Unit-II			
	a i) Explain the Working Principle of a Semiconductor and Discuss the Differences Between N-Type and P-Type Semiconductors.	2	2	14M
	OR			
	b i) Explain the Working of a Transistor (BJT or FET) and Its Applications in Amplification and Switching.	2	2	14M
3	Unit-III			
	a i) Define a Sensor and a Transducer. Explain the Differences Between Them with Examples.	2	3	14M
	OR			
	b i) Explain the Working Principle, Types, and Applications of Temperature Sensors.	2	3	14M
4	Unit-IV			
	a Explain the interaction between sensors, actuators, and PLCs in automated systems. How do these components work together to achieve process control?	2	4	14M
	OR			
	b i) Explain how PLCs achieve real-time control. Discuss the importance of scan time in the performance of PLC systems.	2	4	14M
5	Unit-V			
	a Explore the impact of advancements like IoT, AI, and Industry 4.0 on the future development of PLC systems.	3	5	14M
	OR			
	b i) Provide examples of industries where PLCs are used extensively. How do they enhance efficiency and reliability?	2	5	14M

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



NARASARAOPETA ENGINEERING COLLEGE

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IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC40E08 EMBEDDED AND REAL TIME OPERATING SYSTEM

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	Marks
Unit-I				
1	a i) Classify embedded systems based on generations and provide relevant examples for each generation.	K4	1	7M
	ii) Compare the role of Microprocessors and Microcontrollers in embedded system designs.	K4	1	7M
	OR			
	b i) Examine the significance of embedded systems in some of the major application areas.	K4	1	7M
	ii) Discuss the impact of various memory types (ROM and RAM) on embedded system performance.	K4	1	7M
Unit-II				
2	a i) Explain the core functions of an operating system and analyze how they support real-time systems.	K4	2	7M
	ii) Evaluate the impact of interrupt handling on real-time system performance.	K4	2	7M
	OR			
	b i) Analyze the role of memory management in RTOS and how it differs from general-purpose operating systems.	K4	2	7M
	ii) Survey the requirements of task preemption in RTOS and how context switching affects system performance.	K4	2	7M
Unit-III				
3	a Classify and compare different scheduling algorithms used in RTOS.	K4	3	14M
	OR			
	b i) Examine the use of message queues and mailboxes in task communication..	K4	3	7M
	ii) Differentiate between first-in, first-out (FIFO) and priority-based scheduling algorithms in task scheduling.	K4	3	7M
Unit-IV				
4	a Illustrate the use of a priority inheritance protocol to resolve priority inversion issues.	K3	4	14M
	OR			
	b i) Suggest ways to detect and recover when a deadlock occurs in a multi-tasking system	K4	4	7M
	ii) Classify the different types of semaphores and discuss their application in task synchronization.	K3	4	7M
Unit-V				
5	a i) Investigate the challenges of hardware-software partitioning in co-design and suggest solutions.	K4	5	7M
	ii) Compare logic synthesis and RTL synthesis, highlighting their roles in system design automation.	K4	5	7M
	OR			
	b Discuss the steps involved in RTL synthesis and how they influence the final hardware implementation.	K4	5	14M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC4OE09
CYBER SECURITY
Time: 3 hours
(Common to 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
1	Unit-I				
	a	i) Who are cyber criminals? Discuss any five cybercrimes.	K2	CO1	7M
		ii) List any 10 commands to mount active attacks in cybersecurity.	K1	CO1	7M
	OR				
	b	i) How does stalking work? Explain the different types of stalkers	K2	CO1	7M
		ii) Explain how botnets can be used as a fuel to Cybercrime?	K4	CO1	7M
2	Unit-II				
	a	i) Discuss the key precautions to prevent credit card frauds.	K3	CO2	7M
		ii) Analyze different techniques of credit card frauds and suggest countermeasures	K4	CO2	7M
	OR				
	b	i) Outline the process of push attack on mobile devices.	K2	CO2	7M
		ii) What is phishing? Explain the different methods of phishing attack.	K4	CO2	7M
3	Unit-III				
	a	i) Discuss the tools for password cracking.	K3	CO3	7M
		ii) Distinguish between virus and worms with suitable examples.	K4	CO3	7M
	OR				
	b	i) "Examine the various levels of DoS attacks and assess their impact on system security."	K5	CO3	7M
		ii) Discuss the process of SQL injection.	K2	CO3	7M
4	Unit-IV				
	a	i) Are electronic records admissible in Indian courts? Justify your answer.	K5	CO4	7M
		ii) What is the role of Public key certificate	K2	CO4	7M
	OR				
	b	i) What is contingency planning? How is it different from routine management planning? What are the components of contingency planning.	K4	CO4	7M
		ii) Discuss the impact of Digital signatures in ITA 2000	K2	CO4	7M
5	Unit-V				
	a	i) outline the best practices in handling digital evidence	K3	CO5	7M
		ii) what are the various phases and activities involved in the life cycle of forensics investigation process	K2	CO5	7M
	OR				
	b	i) What is a social networking site? Discuss the security threats associated with social media platforms.	K4	CO5	7M
		ii) Examine how antifoensics techniques are used to evade detection in Cybercrimes	K5	CO5	7M

IV B.Tech I Semester Regular & Supple. Examinations, October-2025

Sub Code: R20CC4117 **ENTREPRENEURSHIP AND INNOVATION**

Time: 3 hours

(Common to All Branches)

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) Define entrepreneur? Identify the types of risks taken by entrepreneurs. Determine the motivation behind entrepreneurs taking risks?	K1,K2 & K3	1	7M
	ii) Examine the role of entrepreneurship in economic development.	K5	1	7M
	OR			
	b i) Explain the types of entrepreneurs. Write about Fabian entrepreneurs.	K2 & K3	1	7M
	ii) Analyze the role of financial institutions support in the growth and development of entrepreneurs.		1	7M
2	Unit-II			
	a i) List the factors affecting creativity. Describe the process of creativity.	K1 & K2	2	7M
	ii) Distinguish between innovation and creativity. Write about the importance of creativity.	K4	2	7M
	OR			
	b i) Describe the different types of creativity and innovation	K2	2	7M
	ii) List the characteristics and elements of innovation.	K1	2	7M
3	Unit-III			
	a i) Analyze the roles of entrepreneurial development programs (EDP) in the success of entrepreneurs.	K4	3	7M
	ii) Explain the phases of EDP.	K3	3	7M
	OR			
	b i) Write about the need assessment of an entrepreneurial development programs (EDP) for existing and new entrepreneurs.	K2	3	7M
	ii) Prepare an entrepreneurial development programs (EDP) for new entrepreneurs.	K6	3	7M
4	Unit-IV			
	a i) Define new idea? Identify the sources of new ideas. Explain the methods of generating new ideas.	K1 & K2	4	7M
	ii) Summarize process of conducting project feasibility study. Discuss relevant criteria set for feasibility study.	K5 & K2	4	7M
	OR			
	b i) Describe project life cycle.	K2	4	7M
	ii) ABC project requires an initial investment of \$ 2000 and it is expected to generate a cash flow of \$ 100 for 3 years plus \$ 12500 in the third year. The target rate of return of the project is 10% per annum. Calculate the net present value of the project.	K5	4	7M
5	Unit-V			
	a i) Write the salient features of MSME development act 2006.	K2	5	7M
	ii) Appraise the existing policies and their support to MSMEs.	K5	5	7M
	OR			
	b i) Discuss about internal and external growth strategies meant for MSMEs	K3	5	7M
	ii) List the factors causing for sickness in small businesses. Suggest remedial measures to overcome them.	K1 & K6	5	7M



NARASARAOPETA ENGINEERING COLLEGE

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IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Code: R20CC4104/R20CC40E16 E-COMMERCE

3 hours

Max. Marks: 70

Note: Answer All FIVE Questions.

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

	Questions	KL	CO	M
Unit-I				
a	i) Outline the benefits of implementing E-Commerce organization applications in terms of cost reduction and process automation.	K2	CO1	7M
	ii) Explain in detail anatomy of E-Commerce?	K2	CO1	7M
OR				
b	i) Describe the key components of an E-Commerce framework and their roles in a digital business environment.	K2	CO1	7M
	ii) Explain in detail E-Commerce Consumer applications?	K2	CO1	7M
Unit-II				
a	i) Illustrate a real-time example of an electronic payment process and demonstrate the steps involved in mitigating risks such as fraud or identity theft.	K3	CO2	7M
	ii) Describe briefly Consumer Oriented E-commerce?	K3	CO2	7M
OR				
b	i) Explain in detail Electronic payment systems?	K3	CO2	7M
	ii) Demonstrate how the Mercantile Process Model can be implemented	K3	CO2	7M
Unit-III				
a	i) Explain the key components of Supply Chain Management and their role in optimizing internal commerce.	K2	CO3	7M
	ii) Describe the significance of automation in streamlining routine business activities in an intra organizational setup.	K2	CO3	7M
OR				
b	i) Explain the concept of Intra Organizational Commerce and how it differs from Inter Organizational Commerce	K2	CO3	7M
	ii) Explain briefly Intra Organizational Commerce?	K2	CO3	7M
Unit-IV				
a	i) Explain the role of a Document Library in a Corporate Digital Library system	K2	CO4	7M
	ii) Summarize the various techniques used for conducting market research in an online environment	K2	CO4	7M
OR				
b	i) Discuss how online market research helps organizations understand consumer behavior	K2	CO4	7M
	ii) Explain the process of categorizing and organizing digital documents in a corporate setting	K2	CO4	7M
Unit-V				
a	i) Analyse the influence of digital video on consumer buying behavior in an E-Commerce setting.	K4	CO5	7M
	ii) Describe briefly Commerce Catalogues?	K4	CO5	7M
OR				
b	i) Describe briefly Information search and Retrieval?	K4	CO5	14 M

IV B.Tech I Semester Regular & Supple. Examinations, November-2025

R20

Sub Code: R20CC4102/R20CC3OE16

HUMAN COMPUTER INTERACTION

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
1	Unit-I			
	a i) Explain how a well-designed user interface improves user experience. Provide an example	1	1	7M
	ii) Suppose you are designing a new mobile application. Apply at least three UI design principles to enhance usability.	2	1	7M
	OR			
	b i) Identify a commonly used software application and analyze how its UI design benefits the user	1	1	7M
	ii) List and briefly describe any three benefits of a good user interface design	2	1	7M
2	Unit-II			
	a i) Define a Graphical User Interface (GUI) and list any three reasons why graphics are popular in modern interfaces.	1	2	7M
	ii) Explain the concept of Direct Manipulation in GUI. How does it improve user experience?	2	2	7M
	OR			
	b i) List and briefly describe any three characteristics of a good graphical system.	1	2	7M
	ii) Summarize the key reasons behind the popularity of web-based user interfaces over traditional desktop applications.	2	2	7M
3	Unit-III			
	a i) Define Human-Computer Interaction (HCI) and list any three factors that influence human interaction with computers.	1	3	7M
	ii) Explain why human characteristics are important in UI/UX design.	2	3	7M
	OR			
	b i) List and briefly describe three human considerations that must be addressed during the design process.	1	3	7M
	ii) Discuss how human limitations (such as memory constraints and visual perception) affect the design of digital interfaces.	2	3	7M
4	Unit-IV			
	a i) Define screen design and list three key design goals that influence user experience.	1	4	7M
	ii) Explain the importance of screen planning and purpose in designing effective user interfaces.	2	4	7M
	OR			
	b i) List and briefly describe three principles for ordering screen data and content effectively.	1	4	7M
	ii) Discuss the role of focus and emphasis in guiding user attention on a screen.	2	4	7M
5	Unit-V			
	a i) Define a window in the context of UI design and list three common navigation schemes used in modern applications.	1	5	7M
	ii) Explain the difference between device-based and screen-based controls with examples.	2	5	7M
	OR			
	b i) List and briefly describe three important components of a window interface, such as text, messages, and multimedia elements.	1	5	7M
	ii) Discuss the importance of choosing appropriate colors in UI design. How can poor color choices affect usability?	2	5	7M