ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
ADVANCED DESIGN OF REINFORCED CONCRETE STRUCTURES

(CIVIL ENGINEERING)

Time: 3 Hours   Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place
Assume suitable data if necessary
Assume M20 concrete and Fe:415 steel where ever required

		Marks	CO	Blooms Level
	UNIT-I			
1.	Design a combined rectangular footing for two columns C1 and C2 spaced at 3m apart. Characteristic loads on C1 and C2 are 750kN and 1000kN respectively and the size of the columns is 300mm x 600mm where 600mm size is along C1-C2. Width of the footing shall be 2m. The A.B.P on soil is 150kN/m2.	10	1	4
	(OR)			
2.	Design a cantilever wall stem to retain earth with a backfill horizontal. The top of the wall is 5.5 m above the ground level, and the foundation depth may be taken as 1.2 m below ground level, with a safe bearing capacity of 120 kN/m^2. Assume that the backfill has a unit weight of 17 kN/m^2 and an angle of shearing resistance of 35°. Further, assume a coefficient of friction between soil and concrete, $\mu = 0.55$. Use M 20 concrete and Fe 415 steel	10	1	4
	UNIT-II			
3.	A cylindrical tank of capacity 7,00,000 liters is resting on good unyielding ground. The depth of tank is limited to 5m. A free board of 300 mm may be provided. The wall and the base slab are cast rigidly integrally. Design the tank using M25 concrete and Fe415 grade Steel. Draw the following i) Plan at base ii) Cross section through centre of tank.	10	2	3
	(OR)			
4.	Design a rectangular water tank rests on the ground with rigid base for capacity of 600000 litres. The height of tank is 5m use M25 & Fe415 steel	10	2	4
	UNIT-III			
5.	What are the guidelines helpful in predicting the yield line patterns in RC slabs	5	3	3
	Explain the virtual work method of determining the collapse load of RC slabs using yield line theory.	5	3	3
	(OR)			

6.	Design a flat slate of an interior panel 6m X 6m with column size 50mm X 500mm. Provide proper drop and detail the reinforcement. Use M20 and Fe415.	10	3	4

UNIT-IV

7.	A column 600mm x 600mm carries an axial load of 1200kN and is supported on three piles with size 500mm X 500mm. The piles are driven to hard strata available at the depth of 10m. Use M20 concrete and Fe 415 steel. Design the pile	10	4	4

(OR)

8.	Design a pile cap which is supporting a group of 4 piles with load on the column 1500kN. Each pile has a diameter of 400mm. Use M25 concrete and Fe415 steel.	10	4	4

UNIT-V

9.	Find the wind force on the framed building located in terrain with wind speed 40m/s. The building is 45 x 25m in plan and 60m in height, braced in longitudinal direction by rigid frame section.	10	5	3

(OR)

10.	a.	Explain different load factors in wind load calculations and explain each	5	5	2
	b.	Explain detailing for Ductility as per IS code	5		3

UNIT-VI

11.	Design a slab culvert for a span of 6m for class A loading as per IRC. Clear with of road ways – 6m with kerbs 500mm. Use M25 concrete and Fe415 steel.	10	6	4

(OR)

12.	Design a deck slab over a span of 8m, carries class AA loading as per IRC. Clear with of road ways – 5m with kerbs 500mm. Use M25 concrete and Fe415 steel.	10	6	4

AR20

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
Internet of Things
(Computer Science Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
UNIT-I					
1.	a	Define IoT. Describe the characteristics of IoT.	(4M)	CO1	K1,K2
	b	Describe the function of communication functional blocks of IoT.	(6M)	CO1	K2
		(OR)			
2.		Describe the various level of IoT system.	(10M)	CO1	K2
		UNIT-II			
3.	a	Compare and contrast between IoT and M2M.	(5M)	CO2	K2
	b	Outline the limitations of SNMP.	(5M)	CO2	K2
		(OR)			
4.		Describe how NFV can be used for virtualizing IoT device?	(10M)	CO2	K2
		UNIT-III			
5.		Describe the steps involved in IoT system design methodology.	(10M)	CO3	K2
		(OR)			
6.		Discuss in detail about the case study on IoT system for weather monitoring.	(10M)	CO3	K2
		UNIT-IV			
7.	a	Describe various features of a Raspberry Pi device.	(5M)	CO4	K2
	b	Explain Raspberry pi interfaces.	(5M)	CO4	K2
		(OR)			
8.		Draw the diagram of Raspberry pi board and explain each component in the board.	(10M)	CO4	K2
		UNIT-V			
9.		Explain Apache Hadoop in detail.	(10M)	CO5	K2
		(OR)			
10.		Explain Apache Storm and give a brief note on real time data analysis using Apache Storm in REST based and web socket based approaches.	(10M)	CO5	K2
		UNIT-VI			
11.		Discuss about the case study IoT Application of Smart Home.	(10M)	CO6	K2
		(OR)			
12.		Using IoT design methodology steps discuss any productivity application.	(10M)	CO6	K2

CODE: 20ECE321   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
TELECOMMUNICATION SWITCHING SYSTEMS & NETWORKS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		UNIT-I	Marks	CO	Blooms Level
1.	a	Write about basics of a Switching system.	5M	CO1	Understanding
	b	List and Explain the classification of switching systems?	5M	CO1	Understanding
		(OR)			
2.	a	Compare the electronic switching with the manual switching	5M	CO1	Evaluate
	b	Explain the working principle of cross bar switch with a neat diagram.	5M	CO1	Understanding
		UNIT-II			
3.	a	Write about level2 processing in Distributed Stored program control.	5M	CO2	Analyze
	b	How to find availability of exchange in redundant configuration of SPC	5M	CO2	Understanding
		(OR)			
4.	a	What is the significance of SPC and explain the differences between Centralized and Distributed SPC?	5M	CO2	Analyze
	b	Draw the Block diagram of a Redundant Centralized SPC Exchange	5M	CO2	Understanding
		UNIT-III			
5.	a	Explain basic Time division Time Switching with Random Write and Sequential read.	5M	CO3	Understanding
	b	Write about different Switching control methods	5M	CO3	Understanding
		(OR)			
6.	a	Explain Time Division Space Switching	5M	CO3	Understanding
	b	Explain about memory controlled time division time switching	5M	CO3	Understanding
		UNIT-IV			
7.	a	Briefly explain In channel signaling.	5M	CO4	Understanding
	b	Explain the charging plan for Telecommunication Service	5M	CO4	Understanding
		(OR)			
8.	a	Write about Numbering plan.	5M	CO4	Understanding
	b	Write about Network Traffic load and parameters	5M	CO4	Understanding
		UNIT-V			
9.	a	Explain the Layered Network Architecture	5M	CO5	Understanding
	b	Explain different topologies of Data Communication Networks	5M	CO5	Understanding
		(OR)			
10.	a	Draw the simplified block diagram of a data communication network and explain.	5M	CO5	Understanding
	b	Draw and explain ISO-OSI reference model.	5M	CO5	Understanding
		UNIT-VI			
11.	a	Explain ISDN protocol architecture	5M	CO6	Understanding
	b	Explain the principle of operation of packet Switching Network with example	5M	CO6	Understanding
		(OR)			
12.	a	Draw the model of B-ISDN architecture and explain	5M	CO6	Understanding
	b	Explain about Public Switched data networks	5M	CO6	Understanding

CODE: **20ECE322** **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
BIOMEDICAL INSTRUMENTATION
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours   Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		UNIT-I	Marks	CO	Blooms Level
1.	a)	With a neat sketch explain about block diagram of man-instrumentation system?	5	1	L-2
	b)	Explain about the Bio potentials Electrodes?	5	1	L-2
		(OR)			
2.	a)	Explain about the Propagation of Action Potentials?	5	1	L-1
	b)	Explain about the problems encountered in a measuring human body?	5	1	L-2
		UNIT-II			
3.		With a neat sketch explain cardiovascular system?	10	2	L-2
		(OR)			
4.	a)	Explain in detail about Heart Sounds with neat diagrams	5	2	L-2
	b)	With a neat sketch explain characteristics of blood flow.	5	2	L-2
		UNIT-III			
5.		Describe in detail about the lead configurations used in recording of waveforms of ECG?	10	3	L-3
		(OR)			
6.	a)	Explain ultrasonic blood flow measurement?	5	3	L-2
	b)	Explain magnetic induction blood flow measurement?	5	3	L-2
		UNIT-IV			
7.	a)	Write short notes on the elements of Intensive care monitory	5	4	L-1
	b)	Explain in detail about pace makers	5	4	L-2
		(OR)			
8.	a)	Explain about spirometer?	5	4	L-2
	b)	Explain about respiratory therapy equipment.	5	4	L-2
		UNIT-V			
9.	a)	With a neat sketch explain the block diagram of Biotelemetry?	5	5	L-2
	b)	Write about physiological parameters adaptable to bio telemetry?	5	5	L-3
		(OR)			
10.	a)	Explain the telemetry used for emergency patient monitoring?	5	5	L-3
	b)	Explain the applications of telemetry in patient care.	5	5	L-2
		UNIT-VI			
11.	a)	Explain the physiological effects of electrical current?	5	6	L-1
	b)	Explain about shock hazards from electrical equipment?	5	6	L-2
		(OR)			
12.	a)	Explain the methods of accident prevention?	5	6	L-2
	b)	Write about Electromagnetic interference and its effects?	5	6	L-2

CODE: 20EEE322   **SET-2**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023

ADVANCED CONTROL SYSTEMS
(ELECTRICAL AND ELECTRONICS ENGINEERING)
Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
UNIT-I				
1.	For the transfer function $$\frac{Y(s)}{R(s)} = \frac{s(s+2)(s+3)}{(s+1)^2(s+4)}$$ Obtain the state model of i) Phase variable canonical form ii) Jordan canonical form	10	[CO1]	K3
	(OR)			
2. a)	What are the advantages of state space model over transfer function model.	4	[CO1]	K2
b)	Consider a system having state model $$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 3 \\ 5 \end{bmatrix} U \ and \ Y = \begin{bmatrix} 1 & 1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$ With D=0. Obtain its transfer function(T.F)	6	[CO1]	K3
	UNIT-II			
3. a)	Obtain the state transition matrix for $$A = \begin{bmatrix} 0 & -1 \\ 2 & -3 \end{bmatrix}$$	6	[CO2]	K3
b)	Explain properties of state transition matrix.	4	[CO2]	K2
	(OR)			
4.	Consider the system with state equation $$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} U(t)$$ Estimate the state controllability by i) Kalman's test and ii) Gilbert's test	10	[CO2]	K3

UNIT-III

5.   Consider a linear system described by the state model.   10   [CO3] K3

$$\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} x + \begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} u$$

Design a feedback controller with a state feedback so that closed loop poles are placed at -2,-1+j and -1-j

(OR)

6.   Explain design of full order state observer   10   [CO3] K2

UNIT-IV

7. a) Define i) Stability   ii) Asymptotic stability iii) Asymptotic stability in the large   6   [CO4] K2

    b) Write a note on stability of linear and nonlinear systems   4   [CO4] K2

(OR)

8.   A system is described by the following equation   10   [CO4] K3

$$\dot{x} = Ax \text{ where } A = \begin{bmatrix} -1 & -2 \\ 1 & -4 \end{bmatrix}$$

Assuming matrix Q to be the identify matrix, solve for matrix P and comment on the stability of the system using the equation $A^T P + PA = -Q$

UNIT-V

9.   Explain the Model Reference Adaptive Control (MRAC) approach with neat diagram.   10   [CO5] K2

(OR)

10.   Explain series and parallel schemes with any one industrial application with neat diagram   10   [CO5] K2

UNIT-VI

11.   Discuss the concept of formulation of the optimal control problem?   10   [CO6] K2

(OR)

12.   Explain state regulator problem, output regulator problem and tracking problem in detail.   10   [CO6] K2

CODE**: 20ITE322**   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
Image Processing
(Information Technology)

**Time: 3 Hours**   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
	UNIT-I			
1.	What is digital image processing? Explain various applications in image processing.	10M	1	L2
	(OR)			
2.	What is pixel? Explain basic relationship between pixels with example.	10M	1	L2
	UNIT-II			
3.	What is meant by histogram specification? Explain.	10M	2	L2
	(OR)			
4.	What is filtering? Explain image smoothing filter techniques with example.	10M	2	L2
	UNIT-III			
5.	Explain Huffman Coding with an example.	10M	3	L2
	(OR)			
6.	Draw and explain the general image compression system model.	10M	3	L2
	UNIT-IV			
7.	What are various Logical Operations Involving Binary Images and Explain?	10M	4	L2
	(OR)			
8.	What is Hit-or-Miss transformation? Explain	10M	4	L2
	UNIT-V			
9.	Discuss segmentation using morphological watersheds.	10M	5	L2
	(OR)			
10.	Explain about Boundary Extraction and Region Filling Algorithm.	10M	5	L2
	UNIT-VI			
11.	Explain the procedure for converting colors from RGB to HIS and vice versa.	10M	6	L2
	(OR)			
12.	Discuss any two color model used in color image processing.	10M	6	L2

CODE: **20MEE321**   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
ROBOTICS
(MECHANICAL ENGINEERING)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level

<u>UNIT-I</u>

1.	Give the classification of robots based on control system and list merits and demerits	10	1	L2

(OR)

2.	Write short notes on (a) Magnetic gripper and (b) adhesive gripper	10	1	L2

<u>UNIT-II</u>

3.	Explain the working principle of an Infrared sensor and list any four industrial applications where it is used	10	2	L2

(OR)

4.	Explain the mechanism of stepped motor with necessary block diagram	10	2	L2

<u>UNIT-III</u>

5.	Explain about Pure rotation about **x** and **y** axis with a neat sketch	10	3	L2

(OR)

6.	For the simple 6-DOF robot shown in figure, assign the necessary coordinate frames based on the D-H representation, fill out the accompanying parameters table, and derive the forward kinematic equation of the robot	10	3	L3
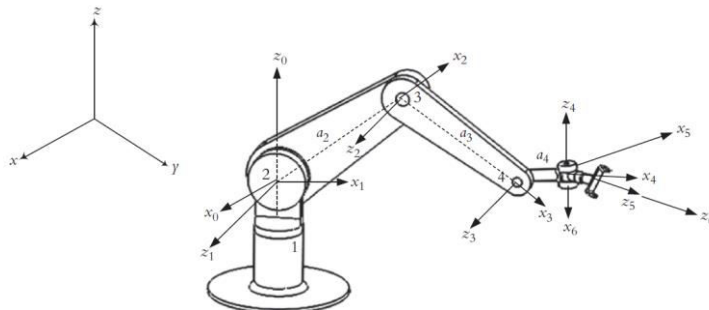
<u>UNIT-IV</u>

7.	Explain about linear segments with parabolic blends in trajectory planning	10	4	L2

(OR)

8. Find the inertia tensor for the rectangular body of uniform   10   4   L3
    density 'ρ' with respect to the coordinate system shown in
    figure also find the inertia tensor
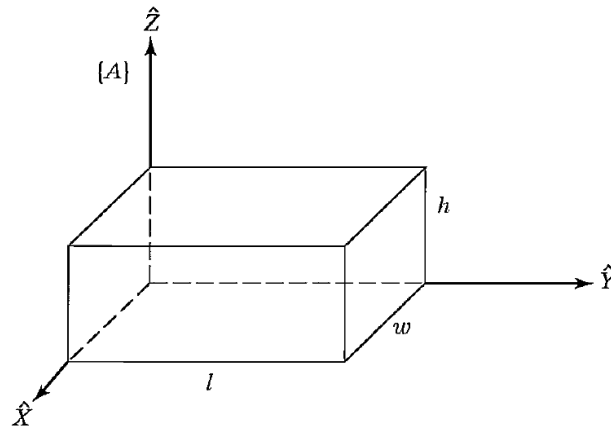
UNIT-V

9. Explain about impertinence lead through programming and   10   5   L3
    tech pendent method.

                              (OR)

10. Write short notes on visibility graph, cell decomposition   10   5   L2
    method and tangent graph based obstacle avoidance.

UNIT-VI

11. Explain machine loading and unloading requirements in   10   6   L2
    manufacturing applications and identify the different sensors
    required to do the task efficiently.

                              (OR)

12. What are the different types of inline work part transfer   10   6   l2
    systems and explain them in detail.

CODE: 20MEE322   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, May, 2023
REFRIGERATION AND AIR CONDITIONING
(MECHANICAL ENGINEERING)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1	(a)	Define unit of refrigeration and COP.	4 M	CO1	L1
	(b)	Explain how refrigerator differs from a heat pump with diagrams.	6 M	CO1	L2
		(OR)			
2		Explain different types of refrigeration cycles briefly.	10 M	CO1	L2

UNIT-II

3		A refrigeration plant of 100 tons capacity uses R22 as refrigerant. The condensing and evaporating pressures are 11.82 bar and 1.64 bar. The refrigerant enters the condenser dry saturated and leaves the condenser sub cooled by 10^0 C. Actual COP is 70% of the theoretical. Find (a) Theoretical and actual COP (b) Mass flow rate in kg/s (c) compressor power. Take the following properties of R22	10 M	CO2	L3

Pressure (bar)	Temperature (C)	Enthalpy hf (kJ/kg)	Enthalpy hg (kJ/kg)	Entropy sf (kJ/kg.K)	Entropy sg (kJ/kg.K)
1.64	- 30	116.1	393.1	0.869	1.803
11.82	+ 30	236.7	414.5	1.125	1.712

Cp (vapour) = 0.55 kJ/kg. K, Cp (liquid) = 1.19 kJ/kg. K

(OR)

4		List out merits and demerits of commonly used refrigerants.	10 M	CO2	L2

UNIT-III

5	(a)	Explain the working of lithium bromide water absorption refrigeration system with a neat compact diagram.	6 M	CO3	L2
	(b)	List out the major fields of applications for lithium bromide water absorption refrigeration system.	4 M	CO3	L2
		(OR)			
6		Explain the working of basic components in an aqua ammonia refrigeration system with a neat sketch.	10 M	CO3	L2

7   An aircraft refrigeration plant has to handle a cabin load of *30* tonnes.   10 M   CO4   L3
The atmospheric temperature is *17°C*. The atmospheric air is
compressed to a pressure of *0.95 bar* and temperature of 30° C due
to ram action. This air is then further compressed in a compressor to
4.75 bar, cooled in a heat exchanger to *67°C*, expanded in
a turbine to 1 bar pressure and supplied to the cabin. The air leaves
the cabin at a temperature of *27°C*. The isentropic efficiencies of both
compressor and turbine are *0.9*. Calculate the mass of air circulated
per minute and the *C.O.P.* For air, c_p = *1.004 kJ/kg K* and
$c_p / c_v = \gamma = 1.4$.

(OR)

8	(a)	Why pre cooling is necessary in JT coolers?	4 M	CO4	L2
	(b)	Illustrate working of mixed refrigerant JT coolers.	6 M	CO4	L2

UNIT-V

9	(a)	Explain the working principle of thermo electric refrigeration system.	6 M	CO5	L2
	(b)	Compare the working of different components of thermo electric refrigeration system with the working of different components of vapour compression system.	4 M	CO5	L2

(OR)

10	(a)	Outline about basic components of steam jet refrigeration.	6 M	CO5	L2
	(b)	List out the advantages and limitations of steam jet refrigeration.	4 M	CO5	L2

UNIT-VI

11	(a)	What is the need for ventilation and infiltration?	4 M	CO6	L2
	(b)	What are the requirements of industrial air conditioning?	6 M	CO6	L2

(OR)

12.	(a)	Illustrate psychometric process of winter air conditioning system for mild cold weather.	4 M	CO6	L2
	(b)	Demonstrate working of winter air conditioning system with double reheat coils and air washer.	6 M	CO6	L2

AR13

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What is pixel?
    b) What are the types of display devices?
    c) What are the properties of line?
    d) Define Boundary fill algorithm?
    e) Define Scaling transformation?
    f) Define clipping algorithm.
    g) Define interpolation and approximation splines?
    h) What is a projection?
    i) What is a key frame in animation?
    j) What is Morphing?

PART-B
Answer one question from each unit   [5x12=60M]

UNIT-I
2. a) Explain Raster scan systems.   6m
    b) Explain CRT monitors.   6m

(OR)

3. a) Explain applications of Computer Graphics..   6m
    b) Compare two technologies available with CRT displays (Raster scan and Random scan)   6m

UNIT-II
4. Scan convert a line from (1,2) and (8,4) using simple DDA and Bresenham's algorithm and comment on the performances   12m

(OR)

5. Explain simple DDA Algorithm with an example.   12m

UNIT-III
6. a) write rotation transformation matrices and rotate a polygon A(0,0), B(1,1), C (5,3) about the origin 45° in clockwise direction.   6m
    b) Prove two successive translation matrices multiplication operation is commutative   6m

(OR)

7. a) Explain the Cohen-Sutherland line clipping algorithm.   6m
    b) Explain 2D translation and \scaling transformations..   6m

UNIT-IV
8. a) What is view volume? Explain 3D clipping.   6m
    b) What are the various techniques in parallel projections?   6m

(OR)

9. a) Explain in detail about uniform Bezier curves.   6m
    b) Discuss about 3-D transformations translation and scaling   6m

UNIT-V
10. Discuss about Z-buffer method & Back-face detection method   12m

(OR)

11. a) Explain the steps in Animation design sequence.   6m
    b) Explain about computer animation languages.   6m

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, May, 2023
Pre-stressed Concrete
(CIVIL ENGINEERING)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the basic concepts of pre stressing .   7M
    b) Advantages of prestressed concrete than R.C.C.beam   7M

(OR)

2. a) List out systems of post tensioning and explain any one system   7M
    b) Explain freyssssinet system with neat sketch   7M

UNIT-II

3. a) list out types of losses and explain any one loss   4M
    b) A concrete beam is prestressed by a cable carrying an initial   10M
        prestressing force of 300Kn.The cross-sectional are of the wires in the
        cable is 300mm^2.Calculate the percentage loss of stress in the cable
        due to shrinkage of concrete using Is:1343 recommendations assuming
        the beam to be (i) pre tensioned (ii) post tensioned Assume
        Es=210Kn/m^2 and age of concrete at transfer =8 days.

(OR)

4.   A prestressed concrete beam 250mm wide 450mm deep has a span of   14M
        10m.The beam is prestressed by steel wires of area 350mm^2 provide at
        uniform eccentricity of 50 mm with an initial prestress of
        1200N/mm^2.Determine the percentage loss of stress in the wires.
        a) If the beam is Pre tensioned beam
        b) If the beam is post tensioned beam
        Ultimate creep strain=40x10^{-6}mm/mm/N/mm^2 for Pre tensioned beam
        Ultimate creep strain=22x10^{-6}mm/mm/N/mm^2 for Pre tensioned beam
        Shrinkage of concrete =300x10^{-6} for Pre tensioned beam
        Shrinkage of concrete =215x10^{-6}for Post tensioned beam
        Relaxation of steel stress=5% of the initial stress
        Anchorage slip=1.25mm; Friction coefficient of wave effect
        =K=.00015

UNIT-III

5. A post tensioned concrete beam of rectangular section 250mm wide is to be designed for a uniformly distributed live load of 12Kn/m over an effective span of 8m.The stress in the concrete must not exceed $17N/mm^2$ in compression and $1.4N/mm^2$ in tension at any time and loss of prestress may be assumed to be 15%   **14M**
   a) Calculate the minimum possible depth of beam
   b) For the section provided, calculate the minimum prestressing force and the corresponding eccentricity

(OR)

6. A prestressing force of 200KN is transmitted through a distribution plate 150mm wide and 150mm deep ,the center of which is located at 100mm from the bottom of an end block having a section 150mm wide and 300mm deep .Evaluate the position and magnitude of the maximum tensile stress on horizontal section passing through the center of the distribution plate using the methods of   **14M**
   a) magnel b) Guyon .Design reinforcement for end b

UNIT-IV

7. A pre cast pre tensioned beam of rectangular section has a breadth of 100 mm and depth of 200mm ,the beam with an effective span of 6m,is prestressed by tendons with their centroid coinciding with the bottom kern. The initial force in the tendon is 200KN. The loss of prestress may be assumed to be 15%.The beam is incorporated in composite T-beam by casting atop flange of breadth 420mm and thickness 40mm,if the composite beam support s a live load of 8Kn/m2,calculate the resultant stresses developed in the precast and in situ cast concrete assuming the pre-tensioned beam: a)unpropped and b0 propped during casting of the slab .assume if any necessary data   **14M**

(OR)

8. Explain the design procedure of composite sections   **14M**

UNIT-V

9. a) What are the factors influencing on deflections   **4M**
   b) A PSC beam with a cross sectional area of $32000mm^2$ and radius of gyration of 70mm is prestressed by a parabolic cable carrying an effective prestress of 1000Mpa, the span of the beam is6m.The cable consists of 6 wires of 7mm diameter wires, has an eccentricity of 50mm at center and zero at support, Estimate the central deflection of the beam   **10M**

(OR)

10. A prestressed concrete beam of rectangular section 300mm wide and 500mm deep is prestressed by 2 post-tensioned cables of area $600mm^2$ each .Initially stressed to$1600N/MM^2$.The cables are located at a constant eccentricity of 100mm throughout the length of the beam having a span of 10m.The modulus of elasticity of steel and concrete is 210 and 38 KN/mm^2 .   **14M**
   a) Neglecting all losses, find the deflection at the centre of span when it is supporting its own weight.
   b) Allowing for 20% loss in prestress, find the final deflection at the centre of span when it carries an imposed load of 18KN/m.

AR18

CODE: 18CST314　　　　　　　　　　　　　　　　　　**SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, May,2023

Data Mining
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What are the challenges of Data mining? Explain.	6
	b)	How do you measure similarity and dissimilarity?	6
		(OR)	
2.	a)	What are the different types of data that you have to handle in data mining?	6
	b)	How is the data quality measured? Explain.	6

UNIT-II

3.	a)	Explain data warehouse architecture with a neat diagram.	7
	b)	What is the role of multi-dimensional data modelling in data mining?	5
		(OR)	
4.	a)	Explain the process of data generalization with an example.	7
	b)	Differentiate between data characterization and generalization.	5

UNIT-III

5.	a)	Explain Frequent pattern mining using Apriori algorithm with a neat sketch.	7
	b)	What is the role of closed itemset in controlling the pattern mining?	5
		(OR)	
6.	a)	Explain Frequent pattern mining using FP Growth algorithm with a neat sketch.	7
	b)	What the techniques to improve the efficiency of apriori algorithm?	5

UNIT-IV

7.	a)	Explain the classification technique using Bayesian Classifier.	7
	b)	What are the issues to be considered during classification?	5
		(OR)	
8.	a)	Explain rule based classifier and state its pros and cons.	7
	b)	What are the accuracy measures used for classification? Write down the formulae.	5

UNIT-V

9.	a)	Explain clustering using K means algorithm.	6
	b)	What are the strengths and weakness of K-means algorithm?	6
		(OR)	
10.	a)	Explain any hierarchical clustering algorithm with a diagram.	6
	b)	Explain any density based clustering algorithm with a diagram.	6

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AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular (RA) / Supplementary Examinations, May, 2023
TELECOMMUNICATION SWITCHING SYSTEMS & NETWORKS
(Professional Elective – II)
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours   Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the various switching network configurations with neat diagrams	6M
	b)	Explain the principles of crossbar switching	6M

(OR)

2.	a)	Explain in detail the basic elements of the switching systems	6M
	b)	Explain the evolution of telecommunications	6M

UNIT-II

3.	Explain different approaches in stored SPC	12M

(OR)

4.	Describe clearly about distributed SPC with necessary diagrams	12M

UNIT-III

5.	Compare in channel signalling and common channel signalling	12M

(OR)

6.	Explain the charging plan, numbering plan and transmission plan in Telecommunication networks	12M

UNIT-IV

7.	a)	Describe data communication circuit configurations.	6M
	b)	Explain layered network architecture.	6M

(OR)

8.	a)	Define open system interconnection. Name and explain functions of each of the Layers of the OSI model.	6M
	b)	Distinguish between connection-less service and connection-oriented service.	6M

UNIT-V

9.	Compare circuit switching and packet switching networks	12M

(OR)

10.	Explain the functions and architecture of ISDN networks	12M

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AR18

CODE: 18MEE311   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular (RA)/Supplementary Examinations, May, 2023
ROBOTICS
(PROFESSIONAL ELECTIVE-I)
(MECHANICAL ENGINEERING)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What is meant by automation? Explain types of automation with diagram.	6M
	b)	With a neat sketch explain types of joints used in robots.	6M
		(OR)	
2.	a)	Explain the hydraulic drive circuit for a robot with neat sketch	9M
	b)	Discuss the advantages of pneumatic actuators.	3M

UNIT-II

3.	a)	Explain with neat sketch how translation is different from rotation.	6M
	b)	Derive fundamental rotation matrix about Z axis	6M
		(OR)	
4.	a)	Explain Denavit-Hartenberg parameters with suitable example and neat sketch	6M
	b)	Explain the inverse kinematic model for RR manipulator.	6M

UNIT-III

5.	a)	Compare the initial accleartion and final velocities for a given motion of equation as $30+2.5T^2+1.6T^3-0.58T^4+0.0464T^5$ for t=1 to t=6 seconds.	6M
	b)	Explain joint space technique with neat sketch.	6M
		(OR)	
6.	a)	Explain the rotary joint jacobian with neat sketch.	6M
	b)	Write a short note on Newton Euler formulation	6M

UNIT-IV

7.	a)	Define sensor and write down the classifications of sensors.	4M
	b)	Describe the working principle of potentiometers with neat sketch.	8M
		(OR)	
8.	a)	Explain manual programming method for a robot.	6M
	b)	Explain the robot programming using teach pendant with neat sketch	6M

UNIT-V

9.	a)	Write a brief note on visibility graph in robot path planning.	6M
	b)	Explain exact cell decomposition in robot path planning	6M
		(OR)	
10.	a)	Explain a robot for pick-and -place operation with neat sketch	6M
	b)	Explain peg-in-hole and multiple peg-in-hole assembly operation with neat sketch.	6M

AR18

CODE: 18CEE311   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, May, 2023
Advanced Design of Reinforced Concrete
(Professional Elective-1)
(CIVIL ENGINEERING)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Design a retaining wall to retain the earth 4 m high. The top surface is horizontal and the wall. The soil behind the wall is a well drained medium dense sand with following properties: unit weight 17 kN/m^3 , Aingle of internal friction $\Phi=30^o$ The material under wall base is the same as above with a safe bearing capacity of 150 KN/m^2. The coefficient of friction between base and soil is 0.55 Design the wall using M20 grade concrete and HYSD reinforcement of grade Fe 415.   **12M**

(OR)

2. a) A counterfort retaining wall has a height of retaining earth of 6 m. The top surface is horizontal behind the wall. The soil behind the wall is a well drained medium dense sand with following properties:
Unit weight 16.2 kN/m³ Angle of internal friction $\Phi=30^o$.
The material under the wall base is the same as above with allowable bearing Pressure of 150 kN/m². The coefficient of friction between the base and the soil is 0.6.Design the wall using M 20 grade concrete and HYSD reinforcement of grade Fe 415.   **12M**

UNIT-II

3. a) Design a circular water tank with flexible connection at base for a capacity of 4,00,000 liters. The tank rests on a firm level ground. The height of tank including a free board of 200 mm should not exceed 3.5m. The tank is open at top. Use M 20 concrete and Fe 415 steel. Draw to a suitable scale: i) Plan at base ii) Cross section through centre of tank.   **12M**

(OR)

4. a) Design a rectangular water tank 5m x 4m with depth of storage 3m, resting on ground and whose walls are rigidly joined at vertical and horizontal edges. Assume M20 concrete and Fe415 grade steel. Sketch the details of reinforcement in the tank   **12M**

UNIT-III

5. a) Write detailed note on yield line analysis by Virtual work method.   **12M**

(OR)

6. a) A two-way R.C.C. slab is rectangular having a size 4m by 5 m with two longer edges fixed in position and the two shorter edges are simply supported. Derive the relation between moment capacity of slab and ultimate load by first principles and hence design the slab for a working live load of 3 kN/m² by yield line theory. Assume µ=0.8 Adopt M-15 grade concrete and HYSD bars.   **12M**

7. a) What are the difference in design of a bored pile and a drive pile?   6 M

    b) An R.C.C. column of a multi-storeyed building transfers following service loads on   6 M
    the pile cap of a pile foundation. Propose the arrangement of piles and determine
    the loads in the piles. The service loads are:

       P = 1600 kN
       Column size 400 mm x 600 mm.

(OR)

8. a) Design a bored pile carrying compressive load 1200 kN and a moment of 30 kNm.   12M
    Use M 15 concrete and Fe 4 15 steel. Assume moment due to minimum
    eccentricity to be less than the actual moment.

UNIT-V

9. a) Explain Indian standard code provisions for Earth quake resistance design for   12M
    flexural members.

(OR)

10. a) A reinforced framed building 60 x 15 m in plan and 50 m in height consisting of 5   12M
    storeys in height. It is braced in the longitudinal direction by rigid frame action
    and by reinforced concrete in fill wall in the transverse direction. Determine wind
    force on the framed building

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