CODE: **20CEE441**   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October -2023
REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM
Professional Elective– IV
(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Describe the electromagnetic spectrum with neat sketch for remote sensing data	5	1	2
	b)	Explain Atmospheric windows of Electromagnetic spectrum.	5	1	2
		(OR)			
2.	a)	Explain the advantages and disadvantages of remote sensing.	5	1	2
	b)	Explain about energy interactions with atmosphere.	5	1	2
		UNIT-II			
3.		Explain different types of platforms.	10	2	2
		(OR)			
4.	a)	Illustrate the types of orbits with neat diagrams?	5	2	2
	b)	What is sensor? Classify the sensors based on their functions.	5	2	1
		UNIT-III			
5.	a)	Write a note on image enhancement techniques	5	3	1
	b)	Explain about digital image processing.	5	3	2
		(OR)			
6.		Differentiate between supervised and unsupervised classification.	10	3	4
		UNIT-IV			
7.		Define GIS. Briefly explain about spatial and Non-spatial data types with relevant examples.	10	4	2
		(OR)			
8.	a)	Explain about map projection.	5	4	2
	b)	List out the data input and output devices used in GIS and explain briefly.	5	4	2
		UNIT-V			
9.	a)	Explain about conditional expressions.	5	5	2
	b)	What is a overlay function? Explain.	5	5	2
		(OR)			
10.		Explain about vector overlay operations.	10	5	2
		UNIT-VI			
11.		Explain how GIS and remote sensing techniques are used in flood zone delineation and mapping.	10	6	5
		(OR)			
12.		Explain the significance of Remote Sensing and GIS in Urban Planning.	10	6	5

CODE: 20CSE442   **SET-1**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October -2023
Human Computer Interaction
(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Illustrate the importance of good design.	5 M	CO1	L2
	b)	Differentiate graphical user interface and the web user interface.	5 M	CO1	L4
		(OR)			
2.	a)	Explain the merits and demerits of direct and indirect manipulation.	5 M	CO1	L2
	b)	Discuss in detail the characteristics of GUI.	5 M	CO1	L2
		UNIT-II			
3.	a)	Compare and contrast direct and indirect methods of requirements analysis.	5 M	CO2	L3
	b)	Explain in detail important Human Characteristics in Design.	5 M	CO2	L2
		(OR)			
4.		What is meant by basic business functions? Discuss in detail the process of determining basic business functions.	10 M	CO2	L3
		UNIT-III			
5.	a)	Illustrate the selection of menu choices.	5 M	CO3	L3
	b)	What are the contents of Menus? Discuss in detail.	5 M	CO3	L2
		(OR)			
6.	a)	Explain in detail phrasing the menu.	5 M	CO3	L2
	b)	Discuss various kinds of graphical menus.	5 M	CO3	L2
		UNIT-IV			
7.	a)	Explain various components of windows.	5 M	CO4	L2
	b)	Discuss any five window operations.	5 M	CO4	L2
		(OR)			
8.	a)	Illustrate the window presentation styles.	5 M	CO4	L3
	b)	Distinguish between window functions and operations.	5 M	CO4	L4
		UNIT-V			
9.	a)	How to write clear text and messages? Explain in detail.	5 M	CO5	L3
	b)	Explain in detail keyboard versus mouse.	5 M	CO5	L2
		(OR)			
10.	a)	Compare and contrast Icons and Images.	5 M	CO5	L2
	b)	Explain how to create meaningful graphics.	5 M	CO5	L3
		UNIT-VI			
11.	a)	What is multimedia? Explain in detail.	5 M	CO6	L2
	b)	What are the possible problems with color? Discuss in detail.	5 M	CO6	L3
		(OR)			
12.	a)	Compare and contrast choosing colors for textual and statistical graphics screens	5 M	CO6	L3
	b)	Explain about modern tool usage to design UI.	5 M	CO6	L2

CODE: **20ECE441**   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October -2023
DIGITAL IMAGE PROCESSING
(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the fundamental steps in Digital Image Processing.	5	CO1	Understand
	b)	With neat sketch explain the structure of human eye.	5	CO1	Understand
		(OR)			
2.	a)	Interpret the basic concepts in Sampling and Quantization.	5	CO1	Understand
	b)	Outline the neighbors of a Pixel, Adjacency, Connectivity, Regions, and Boundaries.	5	CO1	Understand
		UNIT-II			
3.	a)	Explain Discrete Cosine Transform (DCT) in image processing.	5	CO2	Understand
	b)	Develop Hadamard Transformation matrix in image processing.	5	CO2	Apply
		(OR)			
4.	a)	Develop the Haar transform Matrix for N=4 and What are the properties of Haar transform.	5	CO2	Apply
	b)	Develop NxN transformation matrix using Slant Transform.	5	CO2	Apply
		UNIT-III			
5.	a)	Explain how image is enhanced using Histogram Equalization.	5	CO3	Understand
	b)	Identify the procedures of Smoothing Spatial Filters.	5	CO3	Apply
		(OR)			
6.	a)	Interpret the image smoothing in frequency domain using ideal low pass filter.	5	CO3	Apply
	b)	Discuss image sharpening using highpass filters.	5	CO3	Apply
		UNIT-IV			
7.	a)	Represent image degradation model.	5	CO4	Remember
	b)	Demonstrate Minimum Mean Square Error (Wiener) filtering for image restoration.	5	CO4	Apply
		(OR)			
8.	a)	Discuss the basics of full-color image processing.	5	CO4	Understand
	b)	Explain the CMY and CMYK color models.	5	CO4	Understand
		UNIT-V			
9.	a)	Explain point detection concept in image segmentation.	5	CO5	Understand
	b)	What is thresholding? Explain global thresholding.	5	CO5	Understand
		(OR)			
10.	a)	How to link edge points using Hough Transform in local processing.	5	CO5	Apply
	b)	Interpret image segmentation by region growing method.	5	CO5	Apply
		UNIT-VI			
11.	a)	Discuss about coding redundancy.	5	CO6	Understand
	b)	Classify different image compression standards.	5	CO6	Understand
		(OR)			
12.	a)	Explain functional block diagram of a general image compression system.	5	CO6	Understand
	b)	Demonstrate Huffman coding with an example.	5	CO6	Apply

CODE: 20ECE442   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October -2023
SATELLITE SYSTEMS & GPS
(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Discuss in detail about the history of satellite communications?	5M	CO1	BL2
	b)	State and explain how Kepler's laws are useful in satellite communication?	5M	CO1	BL4
		(OR)			
2.	a)	Illustrate in detail about the orbital effects in satellite communications?	5M	CO1	BL4
	b)	Write short notes on launch and launch vehicles?	5M	CO1	BL2
		UNIT-II			
3.		Illustrate the role and working of telemetry tracking, command and monitoring subsystem in satellite communication?	10M	CO2	BL2
		(OR)			
4.		Explain in detail about generation of power in satellite sub systems?	10M	CO2	BL2
		UNIT-III			
5.	a)	Write short notes on G/T ratio?	5M	CO3	BL3
	b)	Explain in detail about the satellite uplink design?	5M	CO3	BL2
		(OR)			
6.	a)	Write short notes on noise figure and noise temperature?	5M	CO3	BL2
	b)	Derive the expression for overall C/N ratio? Also define what is C/N?	5M	CO3	BL5
		UNIT-IV			
7.		Explain in detail with neat block diagram the transmitter and receiver of a basic earth station and explain the function of each block?	10M	CO4	BL2
		(OR)			
8.		Illustrate in detail about the types of antenna configurations used in earth station technology?	10M	CO4	BL2
		UNIT-V			
9.	a)	Elaborate in detail about the history and evolution of GPS?	5M	CO5	BL2
	b)	Write short notes on working principle of GPS?	5M	CO5	BL4
		(OR)			
10.	a)	Explain the development of NAVSTAR GPS in detail.	5M	CO5	BL2
	b)	Illustrate in detail about the determination of receiver position using trilateration method in 2D?	5M	CO5	BL4
		UNIT-VI			
11.	a)	Elaborate in detail about the different types of GPS system segments?	5M	CO6	BL2
	b)	Discuss in detail about GPS navigation data?	5M	CO6	BL2
		(OR)			
12.	a)	Explain in detail about C/A code using C/A code generator?	5M	CO6	BL2
	b)	Elaborate in detail about anti spoofing concept?	5M	CO6	BL2

CODE: **20EEE441**   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October-2023
POWER SYSTEM OPERATION AND CONTROL
(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.	a)	Derive the equation for optimal load sharing among n units in a power system by neglecting transmission losses	5	1	2
	b)	The incremental cost characteristics of the two units in a plant are IC1 = 0.4P1 +25 Rs/MWh IC2 = 0.4P2 + 35 Rs/ MWh. If the total load is 200 MW, estimate the optimum load schedule	5	1	3
		(OR)			
2.		A constant load of 400MW supplied by two 210MW generators 1 and 2, for which the respective fuel cost characteristics are $C_1=0.05P_{G1}^2+20P_{G1}+30$, $C_2=0.06P_{G2}^2+15P_{G2}+40$, With P in MW and C in Rs/h. Determine (i) the most economical division of load between the generators (ii) the saving in Rs/day there by obtain compared to equal load sharing between the machines	10	1	3
		UNIT-II			
3.	a)	On a system consisting of two generating plants, the incremental costs in Rs./MWh with P_{G1} and P_{G2} in MW are $\frac{dc_1}{dp_{G1}} = 0.008P_{G1} + 8$ $\frac{dc_2}{dp_{G2}} = 0.012P_{G2} + 9$ The system is operating on economic dispatch with $PG1 = PG2 = 500$ MW and $\frac{dP_L}{dp_{G2}} = 0.2$. Find the penalty factor of Plant-1.	5	2	3
	b)	Give the flow chart for economic allocation of generation among generators of a thermal system taking into account transmission losses	5	2	2
		(OR)			
4.		Explain economic operation of power system with transmission losses is taking into account and explain the significance of penalty factor	10	2	2
		UNIT-III			
5.	a)	Discuss the Dynamic programming method to solve Unit commitment problem in power systems	5	3	2
	b)	What is the need of unit commitment? Explain the constraints in unit commitment	5	3	1
		(OR)			
6.		A two-plant system that has a thermal station near the load center and a hydro-power station at a remote location is shown in Fig. 6.5. The characteristics of both stations are $C_1 = (26 + 0.045PGT)P_{GT}$ Rs./hr $W_2 = (7 + 0.004PGH)P_{GH}$ m3/s and $\gamma_2 =$ Rs. $4 \times 10\text{-}4$/m3 The transmission loss coefficient, $B22 = 0.0025$ MW^{-1}. Determine the power generation at each station and the power received by the load, when $\lambda = 65$ Rs./MWh.	10	3	3

7.	a)	Obtain an expression for steady state response of a load frequency controller.	5	4	2
	b)	Two generators of rating 200 and 400 MW are operated with a droop characteristic of 4% and 5% respectively, from no load to full load. Determine the load shared by each generator, if a load of 600 MW is connected across the parallel combination of those generators.	5	4	3

(OR)

8.	a)	Explain the function of the components of speed governor system of an alternator with a neat schematic diagram	5	4	2
	b)	A 125 MVA turbo-alternator operator on full load operates at 50 Hz. A load of 50 MW is suddenly reduced on the machine. The steam valves to the turbine commence to close after 0.5 s due to the time lag in the governor system. Assuming the inertia to be constant, H=6 kWs per kVA of generator capacity, calculate the change in frequency that occurs in this time	5	4	2

UNIT-V

9.		Two areas of a power system network are interconnected by a tie line, whose capacity is 250 MW, operating at a power angle of 45^0. If each area has a capacity of 2,000 MW and the equal speed-regulation coefficiency of 3 Hz/p.u. MW, determine the frequency of oscillation of the power for a step change in load. Assume that both areas have the same inertia constants of $H = 4$ s. If a step-load change of 100 MW occurs in one of the areas, determine the change in tie-line power	10	5	3

(OR)

10.		Develop the block diagram of load frequency control of two area control system	10	5	2

UNIT-VI

11.	a)	Explain the Static shunt capacitor Compensator and Static series capacitor Compensator for System Control	5	6	2
	b)	A 3-ϕ, 50 Hz, 30-km transmission line supplies a load of 5 MW at p.f. 0.7 lagging to the receiving end where the voltage is maintained constant at 11 kV. The line resistance and inductance are 0.02 Ω and 0.84 mH per phase per km, respectively. A capacitor is connected across the load to raise the p.f. to 0.9 lagging. Calculate the value of the capacitance per phase.	5	6	1

(OR)

12.	a)	What is load compensation? Write the specifications of load compensator	5	6	2
	b)	Write the merits and demerits of different types of compensating equipment for transmission system?	5	6	2

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CODE: 20ITE442   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October-2023
Ad- hoc and Sensor Networks
(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.	a)	What does MANET stand for, and what is its primary characteristic?	5	1	1
	b)	Name two key features of MANETs that distinguish them from traditional wired networks.	5	1	2
		(OR)			
2.	a)	Differentiate between a cellular network and an ad hoc wireless network in terms of their infrastructure and functionality.	5	1	2
	b)	How do MANETs adapt to changes in network topology, and why is this adaptability crucial?	5	1	1
		UNIT-II			
3.	a)	Explain why designing MAC protocols for Ad Hoc Wireless Networks is more challenging compared to wired networks.	5	2	2
	b)	Describe the significance of collision avoidance in Contention-Based MAC protocols and how it improves network efficiency.	5	2	2
		(OR)			
4.	a)	Explain hidden terminal and exposed terminal problems?	5	2	2
	b)	Name two issues commonly encountered when designing MAC protocols for Ad Hoc Wireless Networks.	5	2	2
		UNIT-III			
5.	a)	Define what a MAC protocol is and explain its importance in wireless networks.	5	3	1
	b)	Describe a common issue encountered when designing MAC protocols with scheduling mechanisms.	5	3	2
		(OR)			
6.	a)	Write in detail about Contention based protocols with reservation Mechanisms CATA	5	3	2
	b)	Compare and contrast the characteristics of DSDV and WRP, two Table-Driven Routing protocols, emphasizing their differences and commonalities.	5	3	3
		UNIT-IV			
7.	a)	Define what an On-Demand Routing Protocol is and provide an example of one used in wireless networks.	5	4	1
	b)	Analyse the challenges and issues involved in designing Wireless Sensor Networks, considering factors like energy efficiency, data aggregation, and scalability.	5	4	3
		(OR)			
8.	a)	Name two On-Demand Routing Protocols commonly used in wireless networks.	5	4	2
	b)	Describe the concept of Hybrid Routing Protocols in wireless networks and their advantages.	5	4	2
		UNIT-V			
9.	a)	Discuss the advantages and disadvantages of Layered Architecture in Sensor Networks, considering its impact on network efficiency.	5	5	2
	b)	Explain the concept of Cluster Heads in Clustered Architecture and their role in improving network performance.	5	5	2

10.	a)	Designing a Sensor Network for environmental monitoring in a remote forest area. Describe which network architecture (Layered or Clustered) you would choose and justify your choice based on the application's requirements.	10	5	4

UNIT-VI

11.	a)	List three security requirements specific to Wireless Sensor Networks (WSNs).	5	6	2
	b)	Propose strategies to mitigate a specific attack in a WSN deployment, considering the unique characteristics of these networks.	5	6	3

(OR)

12.	a)	Name two vulnerabilities commonly found in Wireless Sensor Networks (WSNs).	5	6	2
	b)	Evaluate the effectiveness of SPINS, TinySec, and LEAP as secure protocols for WSNs, considering factors like resource efficiency and robustness against attacks.	5	6	3

AR20

CODE: 20MEE441   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, October-2023
INDUSTRIAL HYDRAULICS AND PNEUMATICS
(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)	What are the primary advantages of using fluid power systems in machinery and industrial equipment?	5M	CO1	L1
	b)	List examples of commonly used hydraulic symbols and explain their meanings.	5M	CO1	L5
		(OR)			
2.	a)	Describe the construction and working principles of hydraulic cylinders as actuators.	7M	CO1	L2
	b)	A hydraulic motor is required to drive a load at 500 rpm with 1000 Nm of torque. What is the output power?	3M	CO1	L1
		UNIT-II			
3.	a)	Cite the classification of check valves and explain the function of pilot- operated check valve with neat sketches.	7M	CO2	L3
	b)	Consider a 200 kN press as shown in figure. Weight of the tool= 10kN.Cyinder diameter = 80 mm, Cylinder rod = 60 mm. Determine (a)Find the pressure at annulus side to balance tools. (b) Find the pressure to achieve 200 kN pressing force. (c) If an over- center valve is used instead of counterbalance valve, what is the pressure to achieve 200 kN pressing force. use an over-center valve with a 2:1 pilot input ratio set as 46.63 bar to balance the tools instead of the counter balance valve	3M	CO2	L5

With counter balance valve   *With Over center*
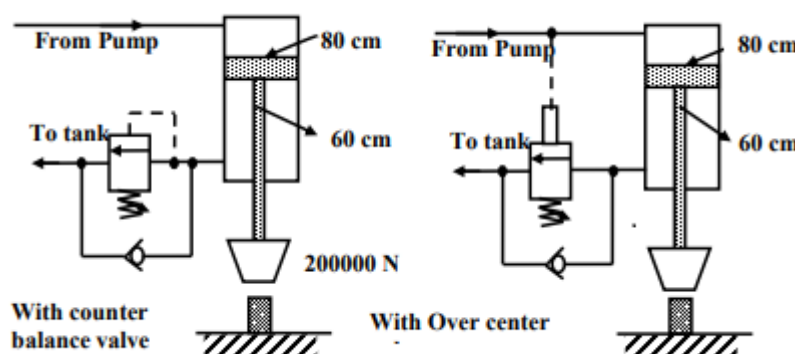
(OR)

4.	a)	Discuss the integration of hydraulic accumulators into fluid power circuits. What types of circuits commonly use accumulators?	5M	CO2	L3
	b)	How can hydraulic intensifiers be used to enhance the performance of hydraulic machinery?	5M	CO2	L1
		UNIT-III			
5.	a)	Design the circuit to speed up the extending speed of a double acting cylinder with suitable circuit.	10M	CO3	L6
		(OR)			
6.	a)	Explain the regenerative circuit for a drilling machine .	10M	CO3	L2

7.	a)	Draw and explain the functions of pneumatic check valve.	10M	CO4	L2

(OR)

8.	a)	Discuss the role of pneumatic actuators in converting compressed air energy into mechanical motion.	5M	CO4	L3
	b)	How does a shuttle valve work, and in what applications is it used?	5M	CO4	L1

UNIT-V

9.	a)	What is the primary purpose of control air and signal air in pneumatic systems, and how do they differ in function and use?	7M	CO5	L1
	b)	Define a pressure sequence valve in the context of pneumatic systems.	3M	CO5	L1

(OR)

10.		Discuss the potential benefits of using time delay valves to sequence pneumatic actions.	10M	CO5	L3

UNIT-VI

11.		Design and draw a circuit using the hydraulic components for the shaping operation	10M	CO6	L6

(OR)

12.		Explain in detail about how the failure and trouble shooting is carried out in hydraulic system	10M	CO6	L2

AR20

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)	Explain the scope of PLM within an organization?	5M	CO1	L2
	b)	Outline the various phases of a product's lifecycle that PLM covers?	5M	CO1	L2
		(OR)			
2.		Develop a hypothetical scenario where a company leverages a changing business environment to identify and seize product opportunities through PLM.	10M	CO1	L2
		UNIT-II			
3		Evaluate the effectiveness of a product's architecture in achieving product goals and meeting customer needs.	10M	CO2	L5
		(OR)			
4.	a)	What is the fundamental importance of understanding and optimizing business processes within an organization?	5M	CO2	L1
	b)	How can organizations leverage their past experiences with business processes to inform future process improvement efforts?	5M	CO2	L1
		UNIT-III			
5.	a)	Outline the key components of a typical data model diagram used in PLM systems?	5M	CO3	L2
	b)	Why is product data often considered a strategic resource for companies? Provide examples of how it can give a competitive advantage.	5M	CO3	L1
		(OR)			
6.	a)	State the generic issues with product data? Explain any two in detail.	5M	CO3	L1
	b)	Explain the tools to represent product data.	5M	CO3	L2
		UNIT-IV			
7.	a)	Describe the specific challenges or problems that organizations face when they do not have a PDM system in place.	5M	CO4	L6
	b)	Enumerate the primary benefits that organizations achieve in implementing PDM system.	5M	CO4	L5
		(OR)			
8.		Identify and explain three common issues or challenges in implementing and using PDM systems.	10M	CO4	L3
		UNIT-V			
9.		Explain the different characteristics of PLM applications.	10M	CO5	L2
		(OR)			
10.	a)	Write any example of KPIs related to PDM system	5M	CO5	L2
	b)	How can organizations leverage lessons learned from previous projects to improve future implementations?	5M	CO5	L1
		UNIT-VI			
11.	a)	How do primary participants roles and responsibilities differ, and why is their engagement crucial?	5M	CO6	L1
	b)	How can feedback mechanisms and knowledge sharing contribute to better change outcomes over time?	5M	CO6	L1
		(OR)			
12.		Explain the typical challenges associated with projects and project planning.	10M	CO6	L2

AR16 (RA)

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular (RA)/Supplementary Examinations, October,2023
Managerial Economics &Financial Analysis
(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)	What is Managerial Economics? How does it differ from traditional Economics?	(7 M)
	b)	Explain the nature of Demand. What could be the different variations in the nature of Demand?	(7 M)

(OR)

2.	a)	What is Demand function? How do you determine?	(7 M)
	b)	State and explain the Law of Demand. What are its exceptions?	(7 M)

UNIT-II

3.	a)	What do you understand by Elasticity of Demand? Explain the factors governing it.	(7 M)
	b)	Explain how Point elasticity is more focussed than Arc elasticity? Illustrate.	(7 M)

(OR)

4.	a)	Enumerate the factors involved in Demand Forecasting. State purpose of forecasting, both short term and long term.	(7 M)
	b)	Examine the Trend Projection method and Collective Opinion method of Demand forecasting.	(7 M)

UNIT-III

5.	a)	Explain various internal and external economies of scale.	(7 M)
	b)	Define a production function. Explain and illustrate Isoquants and Iso-cost curves	(7 M)

(OR)

6.	a)	Discuss the managerial uses of Break Even Analysis as a tool for profit planning. What are its limitations?	(7 M)
	b)	From the following information calculate i). PV Ratio. ii) Break Even Point and iii) Margin of Safety. Total Sales – Rs 6,00,000/-, Selling Price per unit – Rs20/-, Variable cost per unit – Rs10/- and Fixed Cost – Rs 2,00,000/-.	(7 M)

UNIT-IV

7.	a)	Explain how the price is determined in case of perfect Competition.	(7 M)
	b)	Compare and contrast various types of Market structures.	(7 M)

(OR)

8.	a)	Define Capital Budgeting. Explain the steps in Capital Budgeting process.	(7 M)
	b)	Calculate the Net Present Value for X project which initially cost Rs. 2,500/- and generates Year and Net Cash Inflows of Rs 900/-, Rs 800/-, Rs 700/-, Rs 600/- and Rs 500/- in one through five years. The required rate of return is 10%. Calculate the Net Present Value: PV Factors Y1 = 0.909 Y2 = 0.826 Y3 = 0.751 Y4 = 0.683 and Y5 = 0.621.	(7 M)

9. a) What do you understand by Double Entry Book Keeping? What are its (7 M)
        advantages?

    b) From the following transactions write Journal entries into the books of Prabath. (7 M)

2016	Particulars	Rs.
March 1	Goods sold for Cash	2,600
March 3	Goods Purchased for cash	200
March 5	Purchase of Goods on credit from Kumar	3,000
March 7	Sale of Goods to Manikanta on credit	4,000
March 9	Cash received from Manikanta	2,500
March 11	Cash paid to Kumar	2,000
March 15	Furniture purchased for cash	300

(OR)

10.   From the following Trail Balance of Goutham. Prepare Trading Account, Profit (14M)
        and Loss Account for year ending 31st March 2013 and Balance Sheet as on date.

Trail Balance as on 31st March, 2013

Particulars	Dr. Rs	Cr. Rs
Buildings	20,000	
Capital		60,000
Purchases and Sales	10,000	30,000
Opening stock (1-4-2012)	5,000	
Debtors and Creditors	12,000	6,000
Drawings account	4,000	
Sales returns and Purchase returns	2,000	500
Freight	2,500	
Office Salaries	8,000	
Wages	1,500	
Postage & Telegrams	1,000	
Machinery	15,000	
Bills Receivables & Bills Payables	8,000	2,000
Advertisement	2,000	
Cash in Hand	3,500	
Loose Tools	4,000	
Total	**98,500**	**98,500**

 Adjustments:

1. Closing stock valued at Rs. 6,00/-
2. Depreciation on Buildings by 10% and Loose Tools are valued at Rs.3,500/-
3. Interest on Capital at 10% and on Drawings at 5%.

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Supplementary Examinations, October,2023
OPERATIONS RESEARCH
(MECHANICAL 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 different models used in OR   6M
   b) A television company operates two assembly lines, Line I and   8M
   Line II. Each Line is used to assemble the components of 3
   types of television; color, standard, economy. The expected
   daily production on each line is as follows :

TV Model	Line – I	Line – II
Color	3	1
Standard	1	1
Economy	2	6

   The daily running costs of two lines average Rs.6000/- for
   Line I and Rs.4000 for Line II. It is given that the company
   must product at least 24 color, 16 standard and 48 economy
   TV sets for which an order is pending. Determine the number
   of days the two lines should be run to meet the requirements

(OR)

2. Use Big M method to solve   14M

$$\text{Max } Z = 2x_1 + x_2 + 3x_3$$
$$x_1 + x_2 + 2x_3 \le 5$$
$$2x_1 + 3x_2 + 4x_3 = 12$$
$$x_1, x_2, x_3 \ge 0$$

UNIT-II

3. Solve the following transportation problem whose costs are given   14M
   below

		to					
		D1	D2	D3	D4	D5	availability
	A	5	8	6	6	3	800
from	B	4	3	7	6	6	500
	C	8	4	6	6	4	900
	requirements	400	400	500	400	800	

4. Solve the following travelling salesman problem   14M

	A	B	C	D	E
A	∞	2	5	7	1
B	6	∞	3	8	2
C	8	7	∞	4	7
D	12	4	6	∞	5
E	1	3	2	8	∞

UNIT-III

5. a) Use graphical method to minimize the time needed to process   14M
the following jobs on the machines shown, for each machine
find the job which should be done first. Also Calculate the
total time needed to complete both the jobs.

Job 1.   Sequence   A   B   C   D   E

                Time   3   4   2   6   2

Job 2.   Sequence   B   C   A   D   E

                Time   5   4   3   2   6

(OR)

6. a) On an average 96 patients per 24 hour day require the service   8M
of an emergency clinic. Also on average, a patient requires
10 minutes of active attention. Assume that the facility can
handle only one emergency at a time. Suppose that it costs
the clinic Rs.100 per patient treated to obtain an average
servicing time of 10 minutes, and that each minute of
decrease in this average time would cost Rs.10 per patient
treated, how much would have to be budgeted by the Clinic
to decrease the average size of the Queue from $1 \frac{1}{3}$ patients to
$\frac{1}{2}$ patient?

   b) People arrive at a theatre ticket booth is a poison distributed   6M
arrival rate of 25 per hour. Service time is constant at 2 mins.
Calculate   i) The mean number in the waiting time
           ii)   The mean waiting time
           iii)   What is the probability that there is no
                  customer in counter

7. A firm has a machine whose purchase price is Rs 1,00,000. Its   14 M
    running cost and resale price(Rs) at the end of different years
    are as follows

year	1	2	3	4	5	6
Running cost	7500	8500	10000	12500	17500	27500
Resale price	85000	76500	70000	60000	40000	15000

   i) Obtain the economic life of the machine and the minimum average cost
   ii) The firm has obtained a contract to supply the goods produced by the machine for a period of five years from now. After this time period, the firm does not intend to use the machine. If the firm has a machine of this type which is 1 year old, what replacement policy should it adopt if it intends to replace the machine not more than once

(OR)

8. a) Using dominance principle to simplify the rectangular game   8M
       with the following pay of matrix, and solve it graphically:

Player B

		I	II	III	IV
	I	18	4	6	4
Player A	II	6	2	13	7
	III	11	5	17	3
	IV	7	6	12	2

   b) Write about the rules of dominance   6M

9.   A small project is composed of 7 activities whose time   14M
        estimates are listed below.

Activity   Estimated   duration
(weeks)
            Optimistic   Pessimistic Most likely
        1-2   1   1   7
        1-3   1   4   7
        1-4   2   2   8
        2-5   1   1   1
        3-5   2   5   14
        4-6   2   5   8
        5-6   1   6   15

(i) Draw the project network.
(ii) Find expected duration and variance for each
activity.
(iii) Calculate early and late occurrence time for each
node. What is expected project length.

(OR)

10. a) A project consists of 4 activities. Their logical relationship   10M
        and time taken is given along with crash time and cost
        details. if the indirect cost is Rs 2000 per week, find the
        optimum duration and optimum cost

Activity	Predecessor	Normal		Crash	
		Time in days	Cost in Rs	Time in days	Cost in Rs
A	-	4	4000	2	12000
B	A	5	3000	2	7500
C	A	7	3600	5	6000
D	B	4	5000	2	10000
		Total	15600		35500

b) Discuss about cost considerations in project scheduling   4M

AR18(RA)

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular(RA)/Supplementary Examinations, October,2023
PROJECT MANAGEMENT AND OPERATIONS RESEARCH
(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) Enumerate the Need for   Project Management   (6M)
    b) Describe Project Planning and Scheduling in Project Management   (6M)
    (OR)
2.   Write short notes on Project Team Skill Set, Team Motivation, Team   (12M)
        Chemistry.

UNIT-II

3. a) Distinguish between PERT and CPM   (6M)
    b) Explain the procedure for Crashing of Project Time   (6M)
    (OR)
4.   For the given activities determine   (12M)
        i. Critical path using PERT.
        ii.Calculate the Estimated times: EST, EFT, LST, LFT and Total Float

Activity	to	tm	tp
1-2	6	9	12
1-3	3	4	11
2-4	2	5	14
3-4	4	6	8
3-5	1	1.5	5
2-6	5	6	7
4-6	7	8	15
5-6	1	2	3

UNIT-III

5.   Solve the given linear programming problems graphically: (12M)
        Maximize: $Z = 8x + y$
        Constraints are,
        $x + y \leq 40$
        $2x + y \leq 60$
        $x \geq 0, y \geq 0$
    (OR)
6.   There are five jobs (namely 1,2,3,4 and 5), each of which must go through   (12M)
        machines A, B and C in the order ABC. Processing Time (in hours) are given
        below:

Jobs	1	2	3	4	5

Machine A	5	7	6	9	5
Machine B	2	1	4	5	3
Machine C	3	7	5	6	7

Find the sequence that minimum the total elapsed time required to complete the jobs.

UNIT-IV

7. a) What is meant by transportation problem? Distinguish between in balanced and balanced transportation problem   (6M)

    b) Fin d the Initial basic feasible solution of a given transportation problem using North-West corner rule: (6M)

	W_1	W_2	W_3	W_4	Supply
F_1	10	0	20	11	20
F_2	12	7	9	20	25
F_3	0	14	16	18	15
Demand	10	15	15	20	

(OR)

8. A travelling salesman has to visit five cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling time (in hours) for each city from a particular city is given below: (12M)

To From	A	B	C	D	E
A	∞	5	8	4	5
B	5	∞	7	4	5
C	8	7	∞	8	6
D	4	4	8	∞	8
E	5	5	6	8	∞

What is the sequence of visits of the salesman so that the total travelling time is minimised?

UNIT-V

9. A Machine owner finds from his past records that the maintenance costs per year of a machine whose purchase price is Rs. 8000 are as given below: (12M)

Year:	1	2	3	4	5	6	7	8
Maintenance Cost:	1000	1300	1700	2200	2900	3800	4800	6000
Resale Price:	4000	2000	1200	600	500	400	400	400

Determine at which time it is profitable to replace the machine.

(OR)

10. a) Brief about   a. Rules to Find out a saddle point b. Rules of Dominance   (6M)
    b) Find the value of Game using arithmatic method: (6M)

	B1	B2
A1	5	2
A2	3	4

AR18(RA)

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 about sampling and quantization.	6M
	b)	Explain about linear operations used in image processing.	6M

(OR)

2.	a)	Explain the components of an image processing system.	6M
	b)	List and explain applications of Image Processing.	6M

UNIT-II

3.	a)	What is meant by histogram specification? Explain.	6M
	b)	Explain about Image smoothing filters.	6M

(OR)

4.	a)	Explain about Contrast Stretching, with suitable examples.	6M
	b)	Describe about the basic spatial enhancement techniques.	6M

UNIT-III

5.	a)	Describe the types of redundancies, with suitable examples.	6M
	b)	With an example, explain about arithmetic coding.	6M

(OR)

6.	a)	Describe the functional block diagram of general image compression system.	6M
	b)	What is meant by bit-plane coding? Explain.	6M

UNIT-IV

7.	a)	Explain about morphological hit-or-miss transform.	6M
	b)	Discuss about boundary extraction using local processing.	6M

(OR)

8.	a)	Explain the following morphological operations: (i) Erosion (ii) Dilation	6M
	b)	Write short notes on some basic morphology algorithms.	6M

UNIT-V

9.	a)	Explain the following (i) point detection, (ii) line detection	6M
	b)	Describe about basic global thresholding in detail.	6M

(OR)

10.	a)	Explain Region Splitting and merging.	6M
	b)	Explain about region based segmentation.	6M

AR18

CODE: 18EEE441   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Supplementary Examinations, October, 2023

POWER SYSTEM OPERATION AND CONTROL
(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

UNIT-I

1. a) Derive the equation for optimal load sharing among n units in a power system by neglecting transmission losses.   6M
    b) Consider a two bus system as shown in figure below. The incremental production costs at the two generating station are given by   6M
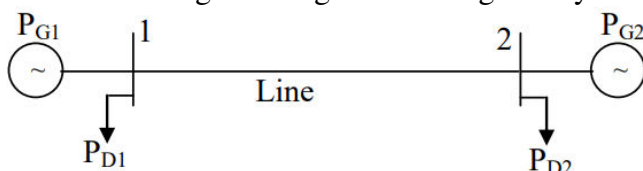
$$\frac{dC_1}{dP_{G1}} = 5 + 0.005\,P_{G1}$$

$$\frac{dC_2}{dP_{G2}} = 6 + 0.004\,P_{G2}$$

The B-coefficients in MW^{-1} are given in the matrix form as

$$B = \begin{bmatrix} 0.0002 & -0.00005 \\ -0.00005 & 0.0003 \end{bmatrix}$$

(OR)

2. a) Explain the following terms with reference to power plants: 6M
        (i) Heat Rate Curve   (ii) Cost Curve   (iii) Input-Output characteristics
    b) Incremental fuel costs in Rs/MWh for Two Units in a plant are given by   6M
        $$\frac{dc_1}{dp_1} = 0.15P_1 + 25, \quad \frac{dc_2}{dp_2} = 0.12P_2 + 15$$
        The minimum and maximum loads on each unit are to be 20MW and 125 MW respectively. Determine IFC and allocation of load between units for the minimum cost and load is 150MW. Assume both the units are operating.

UNIT-II

3. a) Derive mathematical formulation for short term hydro thermal scheduling.   6M
    b) Discuss in detail, the dynamic programming approach for the solution of UCP.   6M

(OR)

4. a) Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants.   8M
    b) Explain the problems and constraints found in unit commitment. How they are solved.   4M

UNIT-III

5. a) Draw a neat sketch of a typical turbine speed-governing system and derive its block diagram representation.   6M
    b) Obtain the dynamic response of change in frequency of isolated power system with block diagram.   6M

(OR)
1 of 2

6. a) Discuss about the basic requirements needed for control strategy in load frequency control. 6M

   b) A 250 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 0.5 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 5.5 kW-sec/KVA of the generator capacity. 6M

UNIT-IV

7. a) Obtain the mathematical modelling of tie line power in an interconnected system and its block diagram. 6M

   b) Two power systems A & B are inter-connected by a tie line and have power frequency constants KA and KB per Hz. An increase in load of 500 MW on system 'A' causes a power transfer of 300 MW from 'B' to 'A'. When the tie line is opened the frequency of system 'A' is 49 HZ and of system 'B' 50 Hz. Determine the values of KA and KB, derive the formulae used. 6M

(OR)

8. For two-area load frequency control with integral controller blocks, derive an expression for steady values of change in frequency and tie line power for simultaneously applied unit step load disturbance inputs in the two areas. 12M

UNIT-V

9. a) List out the merits and demerits of different types of compensation. 6M

   b) Describe the performance of uncompensated transmission lines. 6M

(OR)

10. a) Explain the need of FACTS controllers in transmission systems. 6M

    b) Describe the features of load compensator and its specifications. 6M

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AR18

CODE: 18CEE421   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Supplementary Examinations, October, 2023
Transportation Engineering-II
(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)	Explain the necessity of sleepers in a railway track. What are the desirable qualities or requirements of good sleepers.	6M
	b)	What are the ideal requirements of Rail fastenings?	6M

(OR)

2.		Define Rail Joint. Explain various types with figures	12

UNIT-II

3.	a)	What is gradient? Explain the different types of gradients in railway track Explain Grade Compensation.	6M
	b)	What is a Transition curve, what are the different types and what are the requirements for an ideal transition curve?	6M

(OR)

4.	a)	Explain, with neat sketches, the various considerations for providing extra clearances on Horizontal curves.	6M
	b)	An 8° curve branches off from 4° main curve in B.G. layout. If the speed on branch line is 28 Kmph, find the speed on main line. Cant deficiency is 7.61 cm.	6M

UNIT-III

5.	a)	What is the purpose of Turnout? Give various types with neat diagram.	6M
	b)	Differentiate with a neat sketch of Diamond and Scissors crossing.	6M

(OR)

6.	a)	With a neat sketch, explain the working of semaphore signal	6M
	b)	What is interlocking? Explain various functions of interlocking.	6M

UNIT-IV

7.	a)	Explain the different components of Airport in detail.	6M
	b)	What is a Wind rose diagram? What are its types? Explain any one.	6M

(OR)

8.	a)	Explain the various factors which affect the location of Exit Taxiway.	6M
	b)	What are the basic assumptions made in finalizing runway length? Explain.	6M

UNIT-V

9.	a)	What is Dredging? Classify the different types of dredging works.	6M
	b)	Differentiate Dry and Wet Dock in detail	6M

(OR)

10.	a)	Draw a neat sketch of artificial harbor, explain the various components.	6M
	b)	What are the different types of break waters? Explain any two.	6M

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AR18(RA)

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular(AR)/Supplementary Examinations, October, 2023
VLSI DESIGN
(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)	What are the key advantages of using ICs in electronic devices	6M
	b)	Outline the basic steps involved in the fabrication of NMOS transistors	6M

(OR)

2.	a)	Describe the advantages of Bi-CMOS technology in VLSI design	6M
	b)	Discuss the speed and switching characteristics of COMS and bipolar transistors	6M

UNIT-II

3.	a)	Derive the Ids versus Vds relationship in a MOSFET transistor	6M
	b)	Discuss the operation of BICOMS inverter and explain its advantages	6M

(OR)

4.	a)	Discuss alternative forms of pull-up structures in CMOS logic gates	6M
	b)	Define threshold voltage and discuss its significance	6M

UNIT-III

5.	a)	What are stick diagrams and how they are used in VLSI design	6M
	b)	Describe the process of VLSI design flow	6M

(OR)

6.	a)	What is the significance of well-defined design methodology in VLSI design	6M
	b)	Describe the switch logic in gate level design	6M

UNIT-IV

7.	a)	Describe techniques to lower sheet resistance in MOS technology	6M
	b)	Discuss about wiring capacitance in VLSI circuits	6M

(OR)

8.	a)	Define fan in and fan out and explain the importance	6M
	b)	Discuss about the scaling parameters.	6M

UNIT-V

9.	a)	Discuss the role of design verification tools in VLSI design	6M
	b)	Describe the basic principles of manufacturing tests in CMOS technology	6M

(OR)

10.	a)	Discuss the concept of testability in VLSI design	6M
	b)	Write short notes on BIST	6M

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