AR16

CODE: 16CE4026 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

ENVIRONMENTAL ENGINEERING-II

(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)	Discuss various physical and chemical characteristics of domestic sewage.	6 M
	b)	A sewer is to carry rain water from an area covering 50 hectares. The runoff coefficient is 0.45.The past 10 year record of rainfall shows that a maximum rainfall is 14mm during 20 minutes of time of concentration. Determine the storm water flow for the design of the sewer.	8 M

(OR)

2.	a)	How do you determine the quantity of sanitary sewage?	6 M
	b)	Differentiate self cleaning velocity and limiting velocity in sewers. A stoneware sewer, 30 cm in diameter is laid at a gradient of 1 in 100, using N=0.013 in Manning's formula, calculate the velocity and discharge when the sewer is running half-full.	8 M

UNIT-II

3.	a)	Give a comparison between trickling filter and Activated sludge process.	7 M
	b)	Explain about screening treatment used in primary treatment part of sewage.	7 M

(OR)

4.	a)	List out the components of waste water treatment system with a neat sketch.	7 M
	b)	Discuss various design considerations of a Grit chamber.	7 M

UNIT-III

5.	a)	Draw the generalized flow chart for sludge treatment and disposal.	6 M
	b)	Design a septic tank for a gated community of 375 persons provided with water supply of 200 litres per person per day. Assume any data required.	8 M

(OR)

6.	a)	Explain the significance of disposal of sewage by Dilution and the conditions favourable for it.	6 M
	b)	Design sludge digestion tank with following data (i) Average flow of sewage = 50 x 10^6 litres/day (ii) Total suspended solids = 300 mg/l (iii) Volatile suspended solids = 200 mg/l (iv) Moisture content =85%. Assume other data	8 M

UNIT-IV

7.	a)	Define air pollution and differentiate between natural and man-made air pollutants.	7 M
	b)	List the Indian Air quality standards.	7 M

(OR)

8.	a)	Write a detailed notes on Acid rain and their harmful effects on Environment	7 M
	b)	Discuss Primary and Secondary air Pollutants, Point, Line, and Area sources of air pollutants.	7 M

UNIT-V

9.	a)	Explain noise pollution and its measurement scale? What are the optimum limits for noise pollution?	7 M
	b)	Discuss the impacts of noise pollution in detail.	7 M

(OR)

10.	a)	Explain the different sources of noise pollution.	7 M
	b)	Write about the control methods of Noise Pollution.	7 M

AR16

CODE: 16HS4005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

MANAGERIAL ECONOMICS AND MANAGEMENT SCIENCES

(Electrical and Electronics 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)	Define managerial economics and explain its importance	7M
	b)	Describe the law of demand and its exceptions.	7M
		(OR)	
2.	a)	Discuss the different types of price elasticity of demand.	7M
	b)	Explain the survey and statistical methods of demand forecasting.	7M

UNIT-II

3.	a)	Explain the production with two variable inputs (or Isoquants) with suitable example.	7M
	b)	Describe the importance of internal and external economies of scale.	7M
		(OR)	
4.	a)	Distinguish between fixed cost and variable cost.	7M
	b)	Explain the break-even analysis with suitable example.	7M

UNIT-III

5.		What is market? Explain the features of monopoly and monopolistic competition.	14M
		(OR)	
6.		Describe the price-output determination in case of perfect competition.	14M

UNIT-IV

7.	a)	Explain about Henry Fayol's principles of management.	7M
	b)	What is direction function? Explain its importance in organization.	7M
		(OR)	
8.	a)	Describe the Herzberg's two-factor theory with example.	7M
	b)	Write and explain the different social responsibilities of management.	7M

UNIT-V

9.	a)	What are the elements of marketing mix? Explain them briefly.	7M
	b)	Describe the Product Life Cycle (PLC) with neat sketch.	7M
		(OR)	
10.	a)	Explain the recruitment and selection in detail.	7M
	b)	Write the importance of job evaluation and merit rating.	7M

AR16

CODE: 16ME4028 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

FINITE ELEMENT METHODS

(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

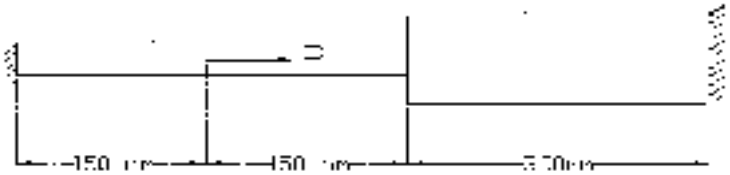
1. Derive material matrix using stress strain relations for a three dimensional body. (14M)

(OR)

2. Explain plane stress and plane strain conditions. Derive stress-strain matrix [D] for both the cases. (14M)

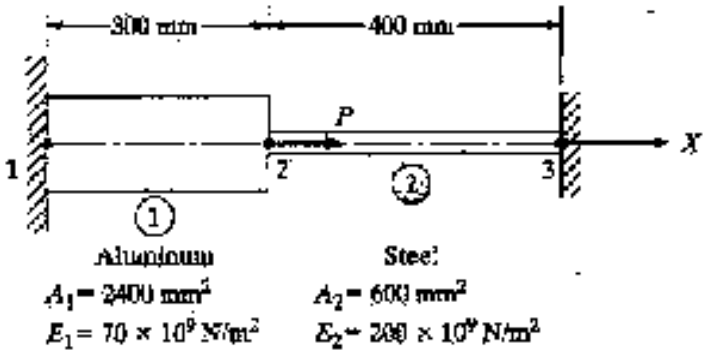
UNIT-II

3. Consider the bar as shown in the below determine the nodal displacements, element stresses, and support reactions using elimination approach. Area of the smaller cross section is **250 mm^2** and larger cross section is **400 mm^2**. Take **P = 300 kN**, and **E = 200 GPa.** (14M)



(OR)

4. A stepped bar is subjected to an axial load of P = 200 kN at the place of change of cross section as shown in figure. Find (i) The nodal displacements (ii) the reaction forces (iii) the induced stresses in each material. (14M)



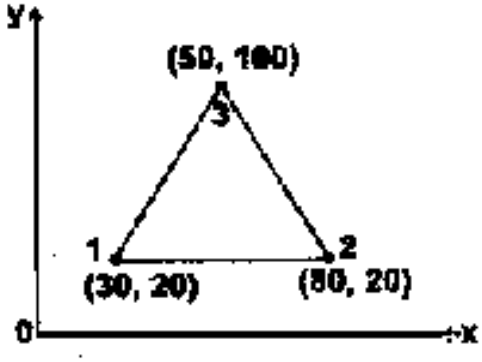
UNIT-III

5. a) Distinguish bar and truss elements. (4M)
   b) Explain the role of transformation matrix in truss and derive stiffness matrix of truss element. (10M)

(OR)

6. a) Derive strain - displacement matrix of CST element. (7M)

   b) Evaluate the stiffness matrix for the plane stress element shown in figure. Assume E = 210 x 10^3 N/mm^2, Poisson's ratio ν = 0.25 and element thickness t = 10 mm. The coordinates are given in millimeters. (7M)



UNIT-IV

7. a) Derive Hermite shape functions for a 2D beam element. (14M)

(OR)

8. a) Derive the Gaussian mid point rule weights and sampling points. (6M)

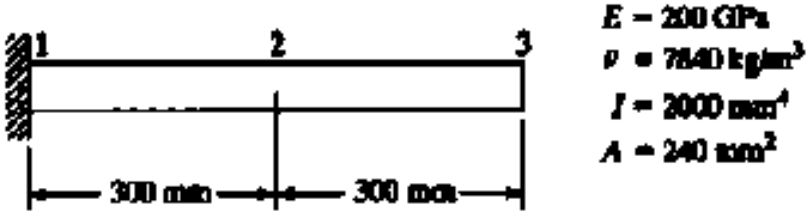
   b) Evaluate the integral $I = \int_{-1}^{1} \left[3e^x + x^2 + \frac{1}{(x+2)}\right] dx$ using one point and two point Gaussian quadrature. Compare with exact solution. (8M)

UNIT-V

9. Derive the mass matrix for 1D bar element and plane truss element. (14M)

(OR)

10. Evaluate the lowest eigenvalue and the corresponding eigenmode for the beam shown in figure. (14M)



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AR16

CODE: 16EC4029 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

VLSI DESIGN

(Electronics and Communication 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)	With neat diagrams, Explain the different steps in PMOS Fabrication of CMOS Transistor	8M
	b)	Explain the Depletion mode NMOS transistor with diagrams	6M
		(OR)	
2.	a)	Describe the N-well process with neat sketches of the process?	7M
	b)	With neat diagrams, Explain the different steps in BiCMOS Fabrication	7M

UNIT-II

3.	a)	Derive the pull-up to pull-down ratio for an nMOS inverter driven through one or more pass transistors?	8M
	b)	Explain about threshold Voltage in MOSFET	6M
		(OR)	
4.	a)	Compute the drain to source current I_{ds} versus V_{ds} relationships for Non-saturation region?	8M
	b)	Draw the diagrams of different forms of Pull ups	6M

UNIT-III

5.	a)	Draw the Stick diagram for 3 input OR gate using CMOS Technology	7M
	b)	Draw the Stick diagram for 2 input AND gate using NMOS Technology	7M
		(OR)	
6.	a)	Draw the Layout for 2 input NOR gate using CMOS Technology	7M
	b)	Draw the Layout for CMOS Inverter	7M

UNIT-IV

7.	a)	What is meant by standard unit of capacitance? Illustrate some area capacitance calculations.	7M
	b)	Discuss the delay Estimation for CMOS and NMOS	7M
		(OR)	
8.		Write the 15 scaling factors for device parameters	14M

UNIT-V

9.	a)	Prepare short notes on i) Observability &controllability ii) Delay fault testing iii) .Fault coverage	9M
	b)	Explain the testing process of VLSI circuit with a block diagram.	5M
		(OR)	
10.	a)	What is the need of testing? Design test sequence vector generator circuit	7M
	b)	Explain the LFSR Concept for IC Testing.	7M

AR16

CODE: 16CS4026 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

DATA ANALYTICS

(Common to CSE and IT)

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. Construct numeric vectors for the following data. You have the results of a simple experiment to look at the visitation of various bee specific to differentiate plants. The number of bees observed as follows: 14 M

   Buff tail: 10 1 37 5 12
   Garden bee: 8 3 19 6 4
   Red tail: 18 9 1 2 4
   Honeybee: 12 13 16 9 10
   Carder bee: 8 27 6 32 23

   Write a program in **R** for the following:
   i) Save all the vector items you just created to a disk file in your working directory.
   ii) Now remove all the vector items that you just made.
   iii) Now recall the vectors from the disk.

(OR)

2. a) Explain in detail the different types of Data items in R. 7M

   b) Describe the Converting List Objects to Data Frames with suitable example. 7M

UNIT-II

3. a) Describe Manipulating Matrix and Data Frames with an example. 7M

   b) Describe Creating Contingency Tables from Complicated Data with an example. 7M

(OR)

4. a) Discuss the following with suitable example 7M
   a)Convert a Data Frame into a List
   b)Convert a Matrix to a Data Frame

   b) Explain the Summary Statistics for Matrix Objects. 7M

UNIT-III

5.	a)	Describe the types of distribution and Construct a histogram for the following vector data: 6 4 3 2 4 5 6 7 8 6 9 3 5 8 2 8 Now alter the number of columns in the histogram. Explain your key observations in brief.	7M
	b)	Describe correlation and covariance? Explain the correlation commands in detail.	7M

(OR)

6.	a)	Illustrate in detail the one-way ANOVA and Two-Way ANOVAs with suitable examples.	7M
	b)	Explain Multiple Category Bar Charts with suitable examples.	7M

UNIT-IV

7.	a)	Discuss in detail the building blocks of Hadoop.	7M
	b)	Explain in brief about the Architecture of GFS.	7M

(OR)

8.	a)	Illustrate the operational modes in Hadoop cluster configuration.	7M
	b)	Define Data node? How does name node tackle data node failures? Explain.	7M

UNIT-V

9.	a)	Explain the anatomy of Map reduce job run.	7M
	b)	Explain the Record reader in detail.	7M

(OR)

10.	a)	Explain about the implementation of Map reduce concept with a simple example.	7M
	b)	Describe in brief about API for Map reduce framework.	7M

AR13

Code: 13EC4019 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

MICROPROCESSORS AND MICROCONTROLLERS

(Electrical and Electronics Engineering)

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

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) When 8086 operates in minimum mode of operation.
   b) What is the function of READY signal in 8086 processor.
   c) Write one logical instruction available in 8086.
   d) What is an interrupt. List the interrupts in 8086.
   e) List two features of 80386 processor.
   f) What is meant by paging of 80386.
   g) What is an USART.
   h) Write two functions of programmable peripheral interface 8255.
   i) Mention two applications of microcontroller.
   j) What is meant by baud rate.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Discuss the architecture of 8086 microprocessor with a neat diagram. [8M]
   b) Explain about Assembler directives with examples. [4M]

(OR)

3. a) Explain the pin diagram of 8086. [6M]
   b) Discuss the register organization in 8086. [6M]

UNIT-II

4. a) Explain the function of the following instructions. i) AAD ii) MOVSB iii) LAHF [6M]
   b) Describe stack point register with an example. [6M]

(OR)

5. a) Discuss about interrupt vector table in 8086. [6M]
   b) What are maskable and non maskable interrupts in 8086. [6M]

UNIT-III

6. a) Enlist the salient features of 80486 processor. [6M]
   b) Discuss the flag registers of 80386. [6M]

(OR)

7. a) Explain the modes of operation of 80386 processor. [6M]
   b) Write short notes on segmentation of 80386. [6M]

UNIT-IV

8.	a)	Draw a neat diagram of Key board/display controller (8279).	[6M]
	b)	Discuss the architecture of 8259A programmable interrupt controller.	[6M]

(OR)

9.	a)	Draw the diagram of DMA 8257 controller.	[6M]
	b)	Explain the briefly the different modes operation of 8255 PPI.	[6M]

UNIT-V

10.	a)	Explain the different addressing modes of 8051.	[6M]
	b)	Explain: i) TCON ii) TMOD registers in detail.	[6M]

(OR)

11.	a)	Explain the I/O pins ports and circuit details of 8051 with its diagram.	[6M]
	b)	Write short notes on PIC microcontrollers.	[6M]

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AR13

CODE: 13IT4010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, August-2021

NETWORK SECURITY AND CRYPTOGRAPHY

(Information Technology)

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

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What are the prime objectives of modern cryptography?
   b) What is the difference between Block chippers and Stream Chipers?
   c) What is the key size of Blowfish Algorithm?
   d) What is the key size of RAS algorithm?
   e) What are the limitations of RFC 822?
   f) What is the purpose of a public key infrastructure?
   g) What is Security Parameter Index (SPI)?
   h) What is dual signature?
   i) What is worm?
   j) What are the two default policies of Packet Filtering Router?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2.	a)	Briefly define the monoalphabetic cipher. What is the difference between a monoalphabetic cipher and a polyalphabetic cipher?	6M
	b)	Explain SQL Injection attack.	6M
		(OR)	
3.	a)	Explain about Transposition Technique.	6M
	b)	What is Buffer Overflow? What are the tasks in exploiting the overflowable Buffer?	6M

UNIT-II

4.	a)	Give the structure of AES. Explain how Encryption/Decryption is done in AES.	10M
	b)	What are the weaknesses of DES?	2M
		(OR)	
5.	a)	How is key expansion done in Blowfish?	6M
	b)	Explain Diffie-Hellman key exchange algorithm.	6M

UNIT-III

6.	a)	How is an enveloped data MIME entity prepared? Write the steps.	6M
	b)	Differentiate between V4 and V5 of Kerberos.	6M
		(OR)	
7.	a)	Explain S/MIME functionality.	8M
	b)	List the transfer encodings used in S/MIME.	4M

UNIT-IV

8.	a)	Explain IP Sec overview.	8M
	b)	Explain the four protocols defined by Secure Socket Layer.	4M
		(OR)	
9.	a)	Briefly explain Encapsulating IP Security Payload.	8M
	b)	Explain about web security considerations.	4M

UNIT-V

10.	a)	What are the different types of Viruses?	6M
	b)	What are design principles of Firewalls?	6M
		(OR)	
11.	a)	Explain about password protection system.	6M
	b)	What is IDS? Explain the profile based IDS?	6M