

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.	Illustrate the process of effective communication with a diagram and explain the different types of communication with example? (OR)	10	C1	K1
2.	Differentiate listening and hearing and list various barriers of listening?	10	C1	K1
<u>UNIT-II</u>				
3.	Explain the importance of interpersonal communication in life and the role played by emotions in interpersonal communication? (OR)	10	C2	K2
4.	Differentiate inter and intra personal communication and write any three barriers of intra personal communication?	10	C2	K2
<u>UNIT-III</u>				
5.	Explain the major categories of nonverbal communication with example? (OR)	10	C3	K2
6.	Illustrate the importance of interview process and mannerism/etiquettes to be followed during interviews?	10	C3	K2
<u>UNIT-IV</u>				
7.	Write a business letter to the principal requesting inclusion of emerging courses in the academics for better career? (OR)	10	C4	K3
8.	Prepare your latest resume for a trainee engineer profile in a multinational company?	10	C4	K3
<u>UNIT-V</u>				
9.	Explain presentation and the steps to be followed for effective presentation? (OR)	10	C5	K2
10.	Explain the purpose of an interview and various steps followed for a successful interview?	10	C5	K2
<u>UNIT-VI</u>				
11.	Illustrate the importance of goal setting and explain smart goals in details? (OR)	10	C6	K3
12.	Write your mission statement as an engineering graduate and illustrate in detail the process for an effective team building?	10	C6	K6

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UNIT-I

1. a) How backtracking is related to recursion and what is the importance of base case Explain with suitable Examples? 6M
- b) You are given a maze in the form of a matrix of size $n * m$. Each cell is either clear or blocked denoted by 1 and 0 respectively. A rat sits at the top-left cell and there exists a block of cheese at the bottom-right cell. Both these cells are guaranteed to be clear. You need to find if the rat can get the cheese if it can move only in one of the two directions - down and right. It can't move to blocked cells. 6M

Input: Is a grid given bellow

```
[{1, 0, 0, 0},  
 {1, 1, 0, 1},  
 {0, 1, 0, 0},  
 {1, 1, 1, 1}  
]
```

Output: true

(OR)

2. a) Explain Binary Search Algorithm with suitable Example? 6M
 - b) Given a sorted array and a target value, return the index if the target is found. If not, return the index where it would be if it were inserted in order. You may assume no duplicates in the array. 6M
- Input: [1,3,5,6], 5
Output: 2

UNIT-II

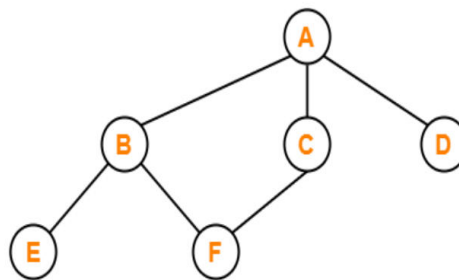
3. a) Explain Quick sort and derive it's time Complexity for Worst case? 6M
 - b) Given a list of non-negative integers nums, arrange them such that they form the largest number and return it. 6M
- Since the result may be very large, so you need to return a string instead of an integer.
Input: nums = [10,2]
Output: "210"

(OR)

4. a) Explain about hashing in detail with examples. 6M
 b) Given an array of integers `arr`, print `true` if the number of occurrences of each value in the array is unique, or `false` otherwise. 6M
 Input: `arr = [1,2,2,1,1,3]`
 Output: `true`

UNIT-III

5. a) i) Explain Inorder Traversal of a tree. 6M
 ii) Construct the pre order tree for the given in order and post order traversal.
 Inorder Traversal : { 4, 2, 1, 7, 5, 8, 3, 6 }
 Postorder Traversal : { 4, 2, 7, 8, 5, 6, 3, 1 }
 b) Explain Union Find Algorithm? 6M
- (OR)
6. Write down the BFS algorithm. Illustrate the BFS algorithm for the Given graph 12M



UNIT-IV

7. a) Explain Greedy Approach With Example? 6M
 b) Given arrival and departure times of all trains that reach a railway station. Find the minimum number of platforms required for the railway station so that no train is kept waiting. 6M
 Consider that all the trains arrive on the same day and leave on the same day. Arrival and departure time can never be the same for a train but we can have arrival time of one train equal to departure time of the other. At any given instance of time, same platform cannot be used for both departure of a train and arrival of another train. In such cases, we need different platforms.
 Input: `n = 6`
`arr[] = {0900, 0940, 0950, 1100, 1500, 1800}`
`dep[] = {0910, 1200, 1120, 1130, 1900, 2000}`
 Output: 3
 Explanation:
 Minimum 3 platforms are required to safely arrive and depart all trains.
- (OR)
8. a) Write down KMP algorithm and explain its time Complexity? 6M
 b) Given an array of size `n` that has the following specifications: 6M
 Each element in the array contains either a policeman or a thief.
 Each policeman can catch only one thief.
 A policeman cannot catch a thief who is more than `K` units away from the policeman.
 We need to find the maximum number of thieves that can be caught.
 Input : `arr[] = {'P', 'T', 'T', 'P', 'T'}`,
`k = 1`.
 Output : 2.
 Here maximum 2 thieves can be caught, first policeman catches first thief and second police-man can catch either second or third thief.

UNIT-V

9. a) Given a set of positive integers and an integer k , check if there is any non-empty subset that sums to k . 6M
Input:
 $A = \{ 7, 3, 2, 5, 8 \}$
 $k = 14$
Output: Subset with the given sum exists
Subset $\{ 7, 2, 5 \}$ sums to 14
- b) Given an array A , maximize value of expression $(A[s] - A[r] + A[q] - A[p])$, 6M
where p, q, r , and s are indices of the array and $s > r > q > p$.
Input: $A[] = [3, 9, 10, 1, 30, 40]$
Output: 46
Explanation: The expression $(40 - 1 + 10 - 3)$ will result in the maximum value
(OR)
10. a) Given an integer array, find a contiguous subarray within it that has the largest sum. 6M
Input: $\{-2, 1, -3, 4, -1, 2, 1, -5, 4\}$
Output: Subarray with the largest sum is $\{4, -1, 2, 1\}$ with sum 6.
- b) Given an $M \times N$ matrix where each cell can have a value of 1, 0, or -1, where -1 denotes an unsafe cell, collect the maximum number of ones starting from the first cell and by visiting only safe cells (i.e., 0 or 1). We can only go left or down if the row is odd; otherwise, we can only go right or down from the current cell. 6M
For example, consider the following matrix shown on the left. The maximum value collected is 9 as marked.

1	1	-1	1	1
1	0	0	-1	1
1	1	1	1	-1
-1	-1	1	1	1
1	1	-1	-1	1

1	1	-1	1	1
1	0	0	-1	1
1	1	1	1	-1
-1	-1	1	1	1
1	1	-1	-1	1

**COMPETITIVE PROGRAMMING - II
(Interdisciplinary Elective – III)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

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UNIT-I

1. a) Discuss how to sort elements using merge sort with suitable example. Write an algorithm for merge sort. 6M
b) Define searching. Discuss linear search technique with algorithm and suitable example. 6M
- (OR)
2. a) Discuss how to sort elements using quick sort with suitable example. Write an algorithm for quick sort. 6M
b) Define searching. Discuss binary search technique with algorithm and suitable example. 6M

UNIT-II

3. a) Write an algorithm to delete an element anywhere from singly linked list and also explain applications of singly linked list. 6M
b) Explain the operations on simple stack with algorithms. Explain applications of stack. 6M
- (OR)
4. a) Write an algorithm to delete an element anywhere from doubly linked list and also explain applications of doubly linked list. 6M
b) Explain the operations performed on queue with algorithms and applications. 6M

UNIT-III

5. a) Define a tree. Explain tree terminology and applications. 6M
b) Define binary search tree. Show how to insert and delete an element from BST. 6M
- (OR)
6. a) What is a graph? Explain graph representations. 6M
b) Explain BFS and DFS with suitable examples. 6M

UNIT-IV

7. a) Explain the syntax of SELECT, CREATE, INSERT and DELETE of SQL? 6M
b) Explain SQL data types, Operators and functions. 6M
- (OR)
8. a) Design an ER diagram for the Students data system taking in account atleast four entities. 6M
b) Present some popular applications of database systems and role of databases. 6M

UNIT-V

9. a) What are different types of JOINS? Explain in detail. 6M
b) Explain subquery and correlated subquery with suitable example. 6M
- (OR)
10. a) Give a set. Of FDs for the relation schema R(A,B, C,D) with primary key AB under which R is in 1NF but not in 2NF. 6M
b) What is Structural query language? Explain its advantages and disadvantages? 6M

Fundamentals of Fuzzy Logic**Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

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UNIT-I

1 12M

Let **A, B and C** be the fuzzy sets defined as

$$A = \{(x_1, 0.2), (x_2, 0.1), (x_3, 1), (x_4, 0.8)\}, B = \{(x_1, 0.6), (x_2, 0.2), (x_3, 0), (x_4, 0.5)\}$$

$$C = \{(x_1, 0.1), (x_2, 0.25), (x_3, 0.11), (x_4, 1)\}. \text{ Find } 1. (A \cup B) \quad 2. (A \cup B) \cup C$$

$$3. (A \cap B) \cap C \quad 4. (A \cap B)^c \quad 5. A^c \cap B^c \quad 6. (A \cap B) \cup (A \cap C)$$

2 12M

$$\text{Let } \mu_B = \left\{ \frac{0.5}{60}, \frac{0.8}{40}, \frac{1}{20} \right\}, \mu_T = \left\{ \frac{0.9}{10}, \frac{0.6}{8}, \frac{0.4}{6} \right\} \text{ and } \mu_U = \left\{ \frac{1}{0.9}, \frac{0.6}{0.7}, \frac{0.4}{0.6} \right\} \text{ find the following relations}$$

$$1. R = B \times T \quad 2. S = T \times U \quad 3. R \circ S.$$

UNIT-II

$$3. \text{ a) Let } A = \left\{ \frac{0.1}{x_1}, \frac{0.9}{x_2}, \frac{0}{x_3} \right\}, B = \left\{ \frac{0}{y_1}, \frac{1}{y_2}, \frac{0}{y_3} \right\}, \text{ if } B' = \left\{ \frac{0.2}{y_1}, \frac{1}{y_2}, \frac{0.3}{y_3} \right\}, \text{ find } A' \text{ using generalized Modus Tollens.} \quad 6M$$

b) Give a brief explanation on : (i) Fuzzy Propositions, (ii) Fuzzy Connectives 6M
(iii) Fuzzy Inference

(OR)

$$4. \text{ Given the fuzzy sets } A \text{ \& } B \text{ on } X \text{ \& } Y, \text{ as } 12M$$
$$A = 1 - 0.2x, x \in [0, 5]; B = 0.25y, y \in [0, 4],$$

(a). Construct a fuzzy relation R for the implication $A \rightarrow B$ (b). Using max-min composition, find B' given $A' = \left\{ \frac{1}{3} \right\}$ **UNIT-III**

5. a) Construct a fuzzy set using “Lagranges Interpolation” method for the following data: $\{(0,0), (0.5,0.2), (0.8,0.9), (1,1), (1.2,0.9), (1.5,0.2), (2,0)\}$. Draw the diagrams. 6M

b) Explain the “Direct method with multiple experts” in construction of a fuzzy set. 6M
Give an example.

(OR)

6. a) Explain the method of construction of fuzzy set. Give an example. 6M

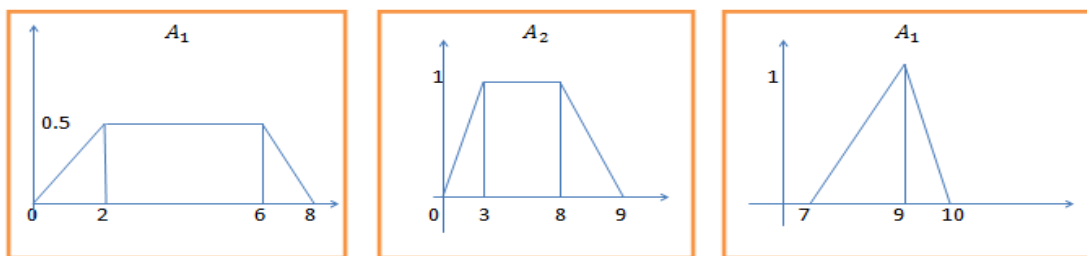
b) Explain the “Direct method with one expert” in construction of a fuzzy set. Give an example. 6M

UNIT-IV

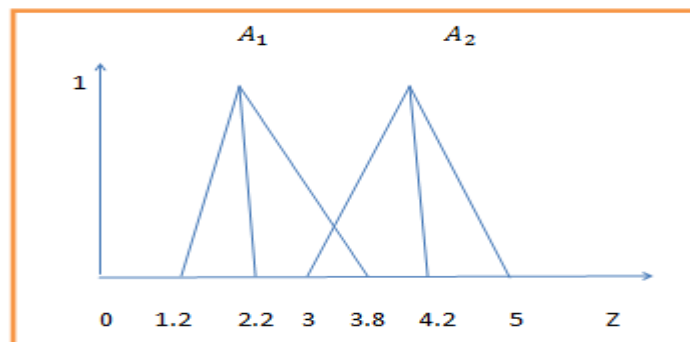
7. a) Explain the working of “Fuzzy Rule Base”. 6M
 b) Explain the process of Fuzzification. 6M
- (OR)
8. Design a Fuzzy controller for a train of a station whose inputs are distance (D) from a station of range 0 to 100 Km, Speed of a train (S) of range 0 to 80 km per Hour. The output is Break power (P) used to control the train. Find the break power (P) when the train is at a distance (D)= 50 km. And speed of the train (S) =60 km. Per hour. 12M

UNIT-V

9. Given three fuzzy sets A_1 , A_2 & A_3 as shown below, Calculate the defuzzified value of z^* using 1. Centroid Method 2. Centre of Sums method 3. Mean of Maxima method 12M



10. For the union of two fuzzy sets A_1 & A_2 as shown below, Calculate the defuzzified value of z^* using 1. Centroid Method 2. Center of Sums method 3. Mean of Maxima method 12M



HRD & ORGANIZATIONAL BEHAVIOR**(Interdisciplinary Elective – III)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

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UNIT-I

1. a) What is Human Resource Development? Describe its salient features. 6M
b) Explain the types of training methods and its merits and demerits. 6M
(OR)
2. a) Discuss the evolution and growth of a HRD. 6M
b) Differentiate between Human Resource Management and Human Resource Development. 6M

UNIT-II

3. a) What is meant by employee assistance programme? State its contents and approaches. 6M
b) Discuss organizational strategies to improve the effectiveness of human resources. 6M
(OR)
4. a) “Like any other HR activities the organizations are also making a major investment in providing employee counselling services as a way to promote employees’ well-being” Discuss. 6M
b) Explain the effectiveness of employee counselling in detail. 6M

UNIT-III

5. a) Explain the approaches of downsizing 6M
b) Explain HRD programs for managing diversity. 6M
(OR)
6. a) Discuss the determinants of employee retention. 6M
b) Define bench marking. How do you evaluate the cost of HR? Explain. 6M

UNIT-IV

7. a) Explain the nature and characteristics of organization behaviour. 6M
b) Define personality. Illustrate the factors affecting the personality of an individual. 6M
(OR)
8. a) Explain the need hierarchy theory of motivation with suitable examples. 6M
b) Define group dynamics. Explain five stages of group formation in detail. 6M

UNIT-V

9. a) What is meaning of organizational change? Elucidate the nature of change with suitable examples. 6M
b) How could we implement the change process? Explain the concept of resistance to change. 6M
(OR)
10. a) Explain the Kurt Lewin's Change Model on unfreezing, changing and refreezing with suitable examples. 6M
b) Discuss the various intervention strategies implementing in organizational change. 6M

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CODE: 18IET332

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B. Tech II Semester Regular (RA) / Supplementary Examinations, May, 2023

ENVIRONMENTAL IMPACT ASSESSMENT

(Interdisciplinary Elective – III)

(For ECE/EEE/MECH)

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) Examine the limitations of EIA. 6M
b) Categorize the various Environmental parameters to be considered for project evaluation. 6M
(OR)
2. a) Define what is EIA? Describe the EIA Process flow chart? 6M
b) What is the purpose of EIA? Explain the EIA guiding principles. 6M

UNIT-II

3. a) Describe the concept of Net works method of Impact assessment; explain net works methodology for pulp mill impact assessment with a flow diagram. 7M
b) Determine criteria for the selection of EIA methodology. 5M
(OR)
4. a) Assess the application of overlay analysis in coal mining. 4M
b) List important Environmental impact assessment methodologies, describe Leopold Interaction matrix method. 8M

UNIT-III

5. a) Explain what are the harmful effects of air pollution on ecosystems? Describe their mitigation methods. 6M
b) Organize a detailed note on Biological Impact Assessment. 6M
(OR)
6. a) Describe biological and regulatory mitigation measures for the mitigation of biological impact. 7M
b) Explain various impacts on flora and fauna by developmental projects. 5M

UNIT-IV

7. a) Explain what is Environmental auditing and describe its advantages. 5M
b) Determine the role of environmental audit for sustainable development. 7M
(OR)
8. a) Describe the two types of Environmental auditing. 4M
b) Examine the stages in Environmental audit protocol (pre-audit/activities at site/post audit activities). 8M

UNIT-V

9. a) Explain why the acts are necessary and write its objectives? 4M
b) Develop an EIS report to a coal mining company. 8M
(OR)
10. a) Explain what are the major steps/elements covered in EIS? What is the format for EIS documentation? 8M
b) Distinguish the functions of CPCB & SPCB in relation to water act. 4M

Answer ONE Question from each Unit

All Questions Carry Equal Marks

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UNIT-I

1. a) What is 2D sampling and quantization? Explain difference between sampling & quantization? 6M
- b) What is Digital Image? And explain how it is represented? 6M
- (OR)
2. a) What are the basic relationships between pixels? Explain in detail. 6M
- b) Explain the various components of general purpose image processing system. 6M

UNIT-II

3. a) What is image enhancement and explain the importance of image enhancement in image processing 6M
- b) Explain about Contrast Stretching and Bit-Plane slicing. 6M
- (OR)
4. a) Differentiate between spatial domain enhancement and frequency domain enhancement? 6M
- b) What are various Spatial operations in a digital image? 6M

UNIT-III

5. a) What is the difference between Lossless and Lossy image compression? and Explain 6M
- b) What is redundancy? Explain the causes of redundancy in an image. 6M
- (OR)
6. a) With an example, explain the concept of Run Length coding. 6M
- b) What is filtering techniques in image processing? and explain following filter techniques BOX filter, Smoothing Linear Filters, Median filters, Sharpening Filters 6M

UNIT-IV

7. a) What are the Applications of morphology? and explain it. 6M
- b) Explain the concept of Dilation and Erosion operation with example 6M
- (OR)
8. a) What is thinning and thickening in image processing? and explain 6M
- b) Explain the opening and closing operations in image morphology with examples? 6M

UNIT-V

9. a) What are the Different Types of Image Segmentation Techniques? Explain Thresholding Segmentation. 6M
- b) Explain about Region Splitting and Merging with an example 6M
- (OR)
10. What is region splitting? Explain the region-based segmentation techniques? 12M