AR18

CODE: 18IET321   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022
FUNDAMENTALS OF FUZZY LOGIC

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. Let **A, B and C** be the fuzzy sets defined as   12M

$A = \{(x_1, 0.2), (x_2, 0.1), (x_3, 1), (x_4, 0.8)\}$, $B = \{(x_1, 0.6), (x_2, 0.2), (x_3, 0), (x_4, 0.5)\}$
$C = \{(x_1, 0.1), (x_2, 0.25), (x_3, 0.11), (x_4, 1)\}$. Find 1. $(A \cup B)$ 2. $(A \cup B) \cup C$
3. $(A \cap B) \cap C$ 4. $(A \cap B)^c$ 5. $A^c \cap B^c$ 6. $(A \cap B) \cup (A \cap C)$

(OR)

2. Let $\mu_B = \left\{\frac{0.5}{60}, \frac{0.8}{40}, \frac{1}{20}\right\}$, $\mu_T = \left\{\frac{0.9}{10}, \frac{0.6}{8}, \frac{0.4}{6}\right\}$ and $\mu_U = \left\{\frac{1}{0.9}, \frac{0.6}{0.7}, \frac{0.4}{0.6}\right\}$ find the following relations 1.   12M
$R = B \times T$ 2. $S = T \times U$ 3. $R \circ S$.

UNIT-II

3. a) Let $A = \{\frac{0.1}{x_1}, \frac{0.9}{x_2}, \frac{0}{x_8}\} B = \{\frac{0}{y_1}, \frac{1}{y_2}, \frac{0}{y_8}\}$, if $B' = \left\{\frac{0.2}{y_1}, \frac{1}{y_2}, \frac{0.3}{y_8}\right\}$, find A' using generalized Modus   6M
Tollens.
   b) Give a brief explanation on : (i) Fuzzy Propositions, (ii) Fuzzy Connectives   (iii) Fuzzy   6M
Inference

(OR)

4. Given the fuzzy sets A & B on X &Y, as $A = 1 - 0.2x, x \in [0,5]$; $B = 0.25y, y \in [0,4]$,   12M
(a). Construct a fuzzy relation R for the implication $A \to B$

b). Using max-min composition, find B' given $A' = \{\frac{1}{3}\}$

UNIT-III

5. a) Construct a fuzzy set using "Lagranges Interpolation" method for the following data: 6M
$\{(0,0), (0.5,0.2), (0.8,0.9), (1,1), (1.2,0.9), (1.5,0.2), (2,0)\}$. Draw the diagrams.
   b) Explain the "Direct method with multiple experts" in construction of a fuzzy set. Give an   6M
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**

9. Given three fuzzy sets A_1, A_2 & A_3 as shown below, Calculate the defuzzified value of z^* using   **12M**

   i). Centroid Method   ii). Centre of Sums method   iii). Mean of Maxima method
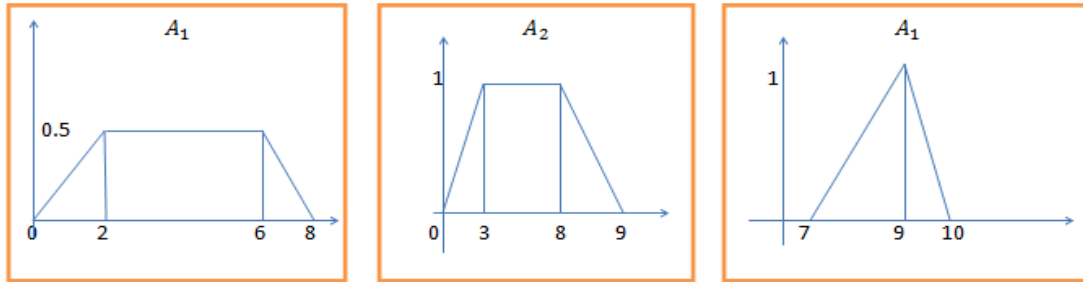
(OR)

10. For the union of two fuzzy sets A_1 & A_2 as shown below, Calculate the defuzzified avalue of Z^* **12M**

    using i). Centroid Method   ii). Center of Sums method   iii). Mean of Maxima

    method

AR18
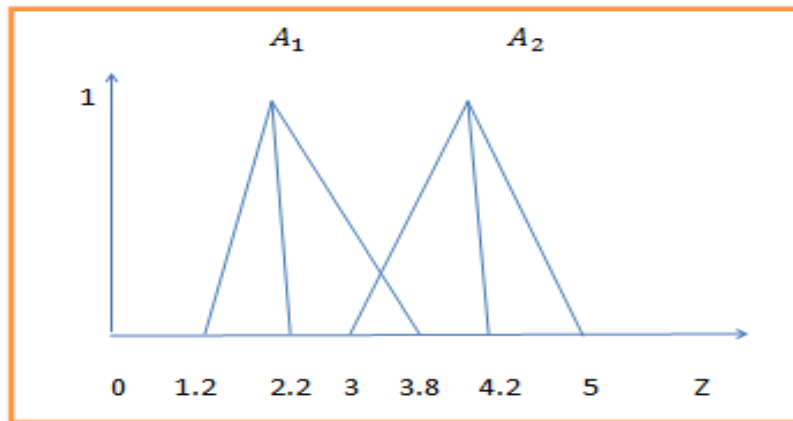
Answer ONE Question from each Unit
Each Questions Carry 12 Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is the difference between extraterrestrial and terrestrial solar radiations? **[6M]**
    b) Explain the different types of instruments for measuring solar radiation. **[6M]**
                                    (OR)
2. a) Define Solar energy, Solar constant and why solar energy as an option. **[6M]**
    b) Explain the working of a Pyranometer solar energy measuring instrument? **[6M]**

UNIT-II

3. a) What are the main components of Flat plate solar collector, Explain the function of each? **[6M]**
    b) Explain various applications of solar energy. **[6M]**
                                    (OR)
4. a) Enumerate the different types of concentrating type collectors? **[6M]**
    b) What are the advantages and Disadvantages of Photo voltaic solar energy conversion. **[6M]**

UNIT-III

5. a) What are the major factors for wind flows on earth? **[6M]**
    b) Describe Horizontal and Vertical axis type wind turbines. **[6M]**
                                    (OR)
6. a) What is biomass? Explain the benefits of using biomass for energy generation. **[6M]**
    b) Explain the process of anaerobic digestion. **[6M]**

UNIT-IV

7. a) Discuss about various types of geothermal resources? **[6M]**
    b) State the advantages and disadvantages of geothermal energy? **[6M]**
                                    (OR)
8. a) Explain the principle of Tidal power Generation. **[6M]**
    b) Discuss about various tidal power conversion plants. **[6M]**

UNIT-V

9. a) Explain the principles of direct energy conversion and examples. **[6M]**
    b) Explain the principle of MHD power generation **[6M]**
                                    (OR)
10. a) Discuss about thermo electric power generator and examples. **[6M]**
    b) Discus about working principle of operation of fuel cell and advantages. **[6M]**

AR18

CODE: 18IET325   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022

PRINCIPLES OF MECHANICAL MEASUREMENTS

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. Distinguish between the following.   12M
   i. Accuracy and precision
   ii. Resolution and Threshold
   iii. Reproducibility and repeatability
   iv. Dead zone and Hysteresis

(OR)

2. Explain the following terms: 12M
   i. Speed of response
   ii. Sensitivity
   iii. Dead time
   iv. Dead Zone

UNIT-II

3. Describe the construction, working of Bourdon tube pressure gauge for measurement of pressure.   12M

(OR)

4. Explain the different techniques used for measurement of flow velocity. Explain the working of ultrasonic flow meter.   12M

UNIT-III

5. What is thermocouple? With a neat sketch explain its construction, working principle and applications.   12M

(OR)

6. Explain working of mercury in glass thermometer with neat sketch.   12M

UNIT-IV

7. Describe in detail the construction and working of an inductive and a capacitive transducers to measure linear displacement.   12M

(OR)

8. Differentiate between resistive, inductive, capacitance type transducers.   12M

UNIT-V

9. Explain principle and working of proving ring and its applications.   12M

(OR)

10. Describe in detail the construction and working of dynamo meter.   12M

***

AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022
PYTHON Programming

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) Brief Introduction to Python & its features.   6M
    b) Write PYTHON basic syntax rules & modes of running programs using IDLE.   6M
    (OR)
2. a) Classify Python operators with suitable examples.   6M
    b) Define variable. Explain Python Data Variables with suitable examples.   6M

UNIT-II

3. a) Illustrate loops (while, for, nested) in Python.   6M
    b) Explain range () function in Python with a suitable example.   6M
    (OR)
4. a) Write Python Boolean expressions with suitable examples?   6M
    b) Python program to sum of all natural numbers till 10 using while & for loop.   6M

UNIT-III

5. a) Explain the operation of concatenation, repetition, indexing, slicing in Python sequences. 6M
    b) Explore the working of **dictionary** operations & functions in Python.   6M
    (OR)
6. a) Explore the working of **set** operations & functions in Python.   6M
    b) Define module. Explore the working of user-defined modules in Python.   6M

UNIT-IV

7. a) Define Exception. Overview some built-in exceptions in Python.   6M
    b) Illustrate exception handling for try-except-else-finally blocks in Python.   6M
    (OR)
8. a) Explore the working of text processing file operations & methods in Python.   6M
    b) Write a Python program that copies content of one file to another file.   6M

UNIT-V

9. a) Summarize the OOPs Terminology in Python.   6M
    b) Write a Python program to create class and object with an example.   6M
    (OR)
10. a) Explore the concept of Polymorphism with a Python program.   6M
    b) Explain function overloading & operator overloading with a Python program.   6M

***

AR18

CODE: 18IET32A   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022
ADVANCED CODING – I

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) Define Function. Explain user defined functions in python with example.   **8M**

   b) Develop a python code to solve the following problem.   **4M**
   Given an array of integers nums and an integer target, print indices of the two numbers such that they add up to target. You may assume that each input would have exactly one solution, and you may not use the same element twice. Find linear solution.
   Sample Test case:
   Input: nums = [2,7,11,15], target = 9
   Output:
   0 1

<p align="center">(OR)</p>

2. a) Define Dictionary. Write various dictionary methods with example. Also explain the concept of nested dictionary.   **8M**

   b) Develop a python code to solve the following problem.   **4M**
   Given an array of integers nums and an integer k, return the number of unique k-diff pairs in the array. A k-diff pair is an integer pair (nums[i], nums[j]), where the following are true:
   • 0 <= i < (j < nums.length)
   • |nums[i] - nums[j]| == k
   Notice that |val| denotes the absolute value of val.
   Sample Test case:
   Input: nums = [3,1,4,1,5], k = 2
   Output: 2

UNIT-II

3. What are OOP principles? Explain how inheritance can be implemented in python with example(s).   **12M**

<p align="center">(OR)</p>

4. a) Define Exception. Write in detail about python exception handling with example.   **8M**

   b) What are constructor and destructors in python? Give example.   **4M**

5. a) Define Time complexity. Explain asymptotic complexity notations.   6M
   b) Solve the following recurrence relation using back substitution   6M
      method.
      $T(n) = 2T(n/2)+n$

(OR)

6. a) Explain Characteristics of an algorithm.   6M
   b) Solve the following recurrence relation using back substitution   6M
      method.
      $T(n) = 3T(n-1)+1$

UNIT-IV

7. a) Explain Extended Euclidean algorithm.   6M
   b) Develop a python code to solve the following problem.   6M
      A happy number is a number defined by the following process:
      Starting with any positive integer, replace the number by the sum of
      the squares of its digits, and repeat the process until the number equals
      1 (where it will stay), or it loops endlessly in a cycle which does not
      include 1. Those numbers for which this process ends in 1 are happy
      numbers.
      Sample Test case:
      Input: 19
      Output: happy number
      Explanation:
      $1^2 + 9^2 = 82$
      $8^2 + 2^2 = 68$
      $6^2 + 8^2 = 100$
      $1^2 + 0^2 + 0^2 = 1$

(OR)

8. a) What is Josephus Circle problem. Give a Solution using python.   6M
   b) Develop a python code to solve the following problem.   6M
      Count trailing zeros in factorial of a number
      Sample Test case:
      Input: 5
      Output: 1

UNIT-V

9. a) Implement Queue using Linked List.   8M
   b) Write an algorithm for the following operations on Double Linked   4M
      List.
      i) Insert at the end
      ii) Traversing the list in reverse

(OR)

10. a) Implement Stack using Queues.   8M
    b) Differentiate Array and Linked Lists.   4M

AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022
COMPETITIVE PROGRAMMING-I

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) How to convert a Octal value to Decimal and Hexa Decimal to Decimal? Explain with an example. — 6M
   b) How to convert a Decimal value into Binary and Binary value into Decimal? Explain with an example. — 6M

(OR)

2. a) Count the number of divisors of given number using O(sqrt(n)). — 6M
   b) What is the procedure for converting a decimal value into binary with an example? — 6M

UNIT-II

3. a) What is an Array in Java? How to pass values to 1D array using Scanner statement at runtime? Explain with suitable example. — 6M
   b) What is iteration? Explain all looping statements with example programs. — 6M

(OR)

4. a) Given an array nums and a value val, removes all instances of that value inplace and print the new length and array after removal.   Don't use any extra memory)
   input: nums= [0,1,2,2,3,0,4,2]
   val= 2
   output: 5 — 6M
   b) Given a sorted array of n integers , create a new array containing squares of all the number of the input array in the sorted order.
   input: 5
   [-2,-1,0,2,3]
   output: [0,1,4,4,9] — 6M

UNIT-III

5. a) What is a package? How to create and import user defined packages? Explain in detail with an example program. — 6M
   b) Write a java program to illustrate method overloading and method overriding. — 6M

(OR)

6. a) Write a java program for STACK ADT using interfaces. — 6M
   b) Write java program to demonstrate the use of subclass. — 6M

UNIT-IV

7. a) Write a java program to implement the concept of exception handling by using all exceptions using finally? — 6M
   b) Distinguish between throw and throws? How to use throw keyword in a program? — 6M

(OR)

8. a) Write a java program to identify the significance of finally block in handling exceptions. — 6M
   b) Write a java program that implements Array Index out of bound Exception using built-in-Exception. — 6M

UNIT-V

9. a) How to measure time complexity and space complexity for algorithm? Explain with an algorithm. — 6M
   b) What is recursion? Write a recursive java program for Fibonacci series? — 6M

(OR)

10. a) What is the time, space complexity of following code & explain in detail: — 6M
```
int a = 0, b = 0;
for (i = 0; i < N; i++) {
    a = a + rand();
}
for (j = 0; j < M; j++) {
    b = b + rand();
}
```
    b) Write a java program for Tower of Hanoi problem. — 6M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester supplementary Examinations, June-2022

ENVIRONMENTAL IMPACT ASSESSMENT

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 preparation of Environmental Base Map.	7M
	b)	Explain the classification of Environmental Parameters.	7M

(OR)

2.	a)	Explain about the Initial Environmental Examination.	7M
	b)	Explain the limitations of EIA.	7M

UNIT-II

3.	a)	Explain about the criteria for selection of EIA methodology.	7M
	b)	Describe about the quality index method for carrying EIA.	7M

(OR)

4.	a)	Explain the network method of EIA for paper mill impacts	7M
	b)	Describe the cost benefit analysis	7M

UNIT-III

5.	a)	Write the causes and effects of deforestation.	8M
	b)	Explain about Environmental assessment process for fauna issues on infrastructure projects.	6M

(OR)

6.	a)	Differentiate between deforestation and forest degradation.	7M
	b)	Describe how impact assessment will be done on wildlife and forests with regard to a highway development project.	7M

UNIT-IV

7.	a)	What is Environmental Audit?	7M
	b)	Explain the objectives of Environmental audit.	7M

(OR)

8.	a)	Discuss about the advantages of Environmental Audit.	7M
	b)	Explain the types of Audit.	7M

UNIT-V

9.	a)	Explain about the water act.	7M
	b)	What are the major functions of CPCB and SPCBs.	7M

(OR)

10.	a)	Explain about the wild life act.	7M
	b)	Discuss about the procedure for conducting environmental impact assessment report	7M

AR16

CODE: 16OE3035   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, June-2022
INTRODUCTION TO SIGNAL PROCESSING

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 causality and stability of a linear time invariant system	6M
	b)	For the following discrete time signals, determine whether or not the system is linear, shift invariant, causal and stable. (i) $y(n)=x(n-1)+x(n+7)$ (ii) $y(n)= nx^2(n)$	8M

(OR)

2.	a)	Define the terms : linearity, time invariance and causality for a discrete time system with examples.	7M
	b)	Define ROC.State all the properties of ROC of Z transform.	7M

UNIT-II

3.	a)	Derive the relation between fourier transform and Z transform	6M
	b)	Determine the 8-point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$.	8M

(OR)

4.	a)	Find IDFT of the sequence $X(k) =\{5,0,1-j,0,1,0,1+j,0\}$	7M
	b)	Determine the output $y(n)$ if $h(n)=\{1,2,1,1\}$; $x(n)=\{1,-1,1,-1\}$ by using Linear Convolution.	7M

UNIT-III

5.	a)	Find the DFT of the sequence $x[n]=\{1,2,1,2,1,2,1,2\}$ using decimation in time algorithm.	8M
	b)	Develop a radix-2 DIF FFT algorithm for evaluating the DFT for N=8.	6M

(OR)

6.	a)	Compare DIT and DIF FFT algorithms	4M
	b)	Find the IDFT of the sequence $X(k)=\{4,1-j2.414,0,1-j0.414,0,1+j0.414,0,1+j2.414\}$ using DIF algorithm.	10M

UNIT-IV

7.	a)	Write the steps to design an analog Chebyshev lowpass filter.	6M
	b)	Design a Butterworth Low pass filter to meet the following specifications $\alpha_{p=}$ 3dB,α_s =18dB,f_p =1kHz,f_s =2kHz	8M

(OR)

8.	a)	Given the specifications $\alpha_{p=}$ 3dB,α_s =16dB,f_p =1kHz,f_s =2kHz.Determine the order of the filter using Chebyshev approximation.Find H(s).	7M
	b)	Apply bilinear transformation to $H(s) = 2/(S+1)(S+2)$ with T=1 sec and find H(z).	7M

UNIT-V

9.	a)	Compare FIR and IIR filters.	4M
	b)	The desired frequency response of a low pass filter is $H_d(e^{jw}) =1$ for $(\pi/4)\leq I \omega I \leq \pi$. =0 otherwise.Determine $H(e^{jw})$ for N =11 using a Hammimg window	10M

(OR)

10.	a)	What is a Hamming window function? Obtain its frequency domain characteristics.	6M
	b)	The desired frequency response of a low pass filter is $H_d(e^{jw}) =1$ for $(\pi/4)\leq I \omega I \leq (3\pi/4)$. =0 otherwise.Determine $H(e^{jw})$ for N =11 using a Hanning window	8M

***