Total No. of Question : [4]   **Registration No. :** ⬜⬜⬜⬜⬜⬜⬜⬜⬜⬜

Programme Name : Bachelor of Computer Science Engineering
Regular S.Y.B.Tech.Sem.IV ESE May / June 2023
IV SEMESTER (2021 BATCH)
201CSL210-Statistics and Fuzzy Systems

Duration :   **Marks : 50**
Instructions :

(Q1) Attempt the following.   [20.0]

(1.1) Find standard deviation of the following data.   [6.0]

xi	5	10	15	20	25
Fi	12	17	22	19	16

CO :- 1
Blooms Taxonomy :- Apply

(1.2) The following table is given.   [7.0]

		Eye colour in Son		
Eye colour in Father		Not Light	Light	Total
	Not Light	230	148	378
	Light	151	471	622
	Total	381	619	1000

Test whether the colour of the son's eyes is associated with that of the fathers.
Given : Value of X^2 is 3.84 for 1 degree of freedom .

CO :- 2
Blooms Taxonomy :- Understand

(1.3) Find the equation of the line of regression of x on y from the following data.   [7.0]

x	2	4	6	8	12	14
y	4	2	5	10	11	12

CO :- 3
Blooms Taxonomy :- Understand

(Q2) Attempt the following.   [10.0]

(2.1) In a large consignment of electric bulbs 10% are defective. A random sample of 20 is [6.0]
taken for inspection .Find the probability that
i)All are good bulbs
ii)At most there are 3 defective bulbs.
iii)At least one defective bulb.

(2.2) If x is a Poisson variate such that P(x=1) = P(x=2). Find $E(x^2)$ [4.0]

OR [2.2 / 2.3]

(2.3) If x is normally distributed with mean & standard deviation 4, find [4.0]
i) $P(5 \leq x \leq 10)$
Ii) $P(x \geq 15)$
[Area under S.N.V z = 0 to z = 1.5 is 0.4332 , z = 0 to z = 0.25 is 0.0987 , z = 0 to z = ∞
is 0.5 & z = 0 to z =2.75 is 0.4970]

(Q3) Attempt the following. [10.0]

(3.1) If fuzzy set A(x) = 1 - $\frac{x}{5}$, X = {0,1,2,3,4,5} then find , [3.0]
i) α - cut of A for α = 0.4
ii) Strong α - cut of A for α = 0.6
iii) Support of fuzzy set A.

OR [3.1 / 3.2]

(3.2) Prove that A ∩ (AUB) = A for the fuzzy set. [3.0]

(3.3) Two fuzzy sets A & B defined on universal set X are [7.0]

$$A(x) = \frac{0}{1} + \frac{0.2}{1.5} + \frac{0.35}{2} + \frac{0.15}{2.5} + + \frac{0.5}{3} + \frac{0.25}{3.5} + + \frac{0.4}{4}$$

$$B(x) = \frac{1}{1} + \frac{0.15}{1.5} + \frac{0.2}{2} + \frac{0.35}{2.5} + + \frac{0.4}{3} + \frac{0.15}{3.5} + + \frac{0}{4}$$

Find the following.
i) $\overline{A \cup B}$
ii) $0.6_{\overline{A \cup B}}$
iii) Height of a fuzzy set $\overline{A \cup B}$

(Q4) Attempt any two. [10.0]

(4.1)

Find the fuzzy cardinality of the fuzzy set.   [5.0]
$A(x) = 1 - \frac{x}{5}$, X = { 0,1,2,3,4,5}

CO :- 6
Blooms Taxonomy :- Apply

(4.2)   Find core (A U B), Support (A-B) , h(B-A),$|A\Delta B|$ for   [5.0]
A(x)=(1,0),(2,0.5),(3,1),(4,0.6),(5,0)
B(x) =(1,1),(2,0.7),(3,0),(4,0.4),(5,1)
X = { 1,2,3,4,5}

CO :- 6
Blooms Taxonomy :- Apply

(4.3)   Consider fuzzy number A & B defined by   [5.0]

$A(x) = \dfrac{x+4}{4}$,if -4<x≤0

$\quad = \dfrac{4-x}{4}$, if 0<x≤4

$\quad = 0$, otherwise

$B(x) = \dfrac{x-4}{4}$,if 4<x≤8

$\quad = \dfrac{12-x}{4}$, if 8<x≤12

$\quad = 0$, otherwise
Calculate fuzzy number A+B.

CO :- 6
Blooms Taxonomy :- Apply

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