SV - 191

Seat No.	

Total No. of Pages : 3

S.E. (Computer Science and Engineering) (Part - II) (Semester - III) Examination, April - 2019
APPLIED MATHEMATICS
Sub. Code : 63524

Day and Date : Friday, 26 - 04 - 2019 **Total Marks : 50**

Time : 09.30 a.m. to 11.30 a.m.

Instructions :
1) **Attempt any two questions from each section.**
2) **Figures to the right indicate full marks.**
3) **Use of non-programmable calculator is allowed.**

SECTION - I

Q1) Attempt any two of the following (each six marks) : **[12]**

a) Find Karl Pearsons coefficient of correlation to the following data.

x	1	6	9	17	28
y	47	49	56	67	78

b) Find the value of the integral in six steps by using Simpsons 1/3 rule.

$$\int_1^{2.2} x^2 \log_e x dx.$$

c) Determine the root of the following equation correct up to four decimal places using Newton Raphson Method $x^3-x-1=0$.

Q2) Attempt any two of the following (each six marks) : **[12]**

a) Find the value of k if following function is discrete probability density function.

x	1	2	3	4	5
y	k	k^2	2k-1	k^2	4k-2

b) The weight of the soap barproduced by a company is normally distributed with mean weight 75 grams and standard deviation 2 grams. If soap bar is selected random and weighted, what is the probability that its will lie
   i) between 75 and 79grams.
   ii) below 79grams (Standard Normal Variate from z=0 to 2 is 0.4772)

c) Average number of mistakes per page in a book are 2. If a book is of 200 pages then how many pages contains
   i) there is no mistakes
   ii) only one mistake.

P.T.O

Q3) a) Fit a Binomial distribution to the following data. [7]

x	0	1	2	3	4	5
f	5	7	16	15	6	1

b) Fit a exponential curve $y = ab^x$ to the following data. [6]

x	1	2	3	4	5
y	2.93	3.15	3.5	3.85	4.2

SECTION - II

Q4) a) Define α-cuts and strong α-cuts and find α-cuts and strong α-cuts for α= 0.5,0.7 for the fuzzy set

$$A(x) = \frac{0}{a} + \frac{0}{b} + \frac{0.5}{c} + \frac{1}{d} + \frac{0.7}{e} + \frac{0.2}{f}.$$ [6]

b) If $A(x) = \frac{0.4}{x1} + \frac{0.2}{x2} + \frac{0.5}{x3} + \frac{0.8}{x4}$

$$B(x) = \frac{0.2}{x1} + \frac{0.3}{x2} + \frac{0.6}{x3} + \frac{0.1}{x4} + \frac{0.1}{x5}$$

Find $\overline{A \cup B}$ and $\overline{A \cap B}$. Also find height of $\overline{A \cup B}$ and $\overline{A \cap B}$. [7]

Q5) Attempt any Two of the following : [12]

a) Find the fuzzy cardinality of the Fuzzy set defined by

$$A(x) = \frac{35-x}{15},\ x \in \{20,22,24,26,28,30,32,34\}.$$

b) For the fuzzy sets A and B, calculate the degree of subset hood S(A,B)

$$A(x) = \frac{0}{0} + \frac{0.2}{1} + \frac{0.35}{2} + \frac{0.15}{3} + \frac{0.5}{4} + \frac{0.25}{5} + \frac{0.4}{6}$$

$$B(x) = \frac{1}{0} + \frac{0.15}{1} + \frac{0.2}{2} + \frac{0.35}{3} + \frac{0.4}{4} + \frac{0.15}{5} + \frac{0}{6}$$

c) Calculate the fuzzy number A-B for the following fuzzy sets.

$$A(x) = \begin{cases} \frac{x+1}{2}, -1 < x \le 1 \\ \frac{3-x}{2}, 1 < x \le 3 \\ 0\ ,\ otherwise \end{cases} \quad \text{and} \quad B(x) = \begin{cases} \frac{x-1}{2}, 1 < x \le 3 \\ \frac{5-x}{2}, 3 < x \le 5 \\ 0\ ,\ otherwise. \end{cases}$$

Q6) Following table represent profit earned by workers from different jobs. Find assignment schedule to maximize profit. **[12]**

		Jobs			
		A	B	C	D
Workers	I	5	4	8	6
	II	4	2	5	4
	III	9	5	8	5
	IV	8	1	7	3

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