

Reg. No:

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**M.Tech I Year I Semester Regular Examinations Jan-2020**

**Discrete Mathematics and Applications**

(CSE)

Time: 3 hours

Max. Marks: 60

UNIT I


- 1 a Is the function defined as follows a density function. 6M  
 $f(x) = e^{-x}, x \geq 0 = 0, x < 0$ . If so determine the probability that the variate having this density will fall in the interval ( 1, 2).  
 b The frequency distribution of a measurable characteristic varying between 0 and 2 is 6M  
 $f(x) = x^3, 0 \leq x \leq 1$   
 $= (2-x)^3, 1 \leq x \leq 2$ . Find the mean value of  $x$  &  $P(0 < x < 1.5)$

OR

- 2 Let  $X$  denote the minimum of the two numbers that appear when a pair of fair dice is thrown once. Determine the (i) Discrete probability distribution (ii) Expectation (iii) variance. 12M

**UNIT II**

- 3 A chemical company, wishing to study the effect of extraction time on the efficiency of an extraction operation, obtained the data shown in the following table. 12M

Extraction time minutes (x)	27	45	41	19	3	39	19	49	15	31
Efficiency (y)	57	64	80	46	62	72	52	77	57	68

Use the method of moments to fit the straight-line  $Y = a + b x$  to the above data.

OR

- 4 a A machinist is making engine parts with angle diameter of 0.7 inch. A random sample of 10 parts shows mean diameter of 0.742 inch with a standard deviation of 0.04 inch. on the basis of this sample would you say that the work is inferior? 6M  
 b In a locality containing 18000 families a sample of 840 families was selected at random. Of these 840 families, 206 families were found to have a monthly income of Rs .250 or less. It is desire to estimate how many out of 18000 families have a monthly income of Rs.250 or less , within what limits would you place your estimate ? 6M

**UNIT III**

- 5 a The question paper of mathematics contains two questions divided into two groups of 5 questions each. In how many ways can an examine answer six questions taking at least two questions from each group. 6M  
 b Out of 9 girls and 15 boys how many different committees can be formed each consisting of 6 boys and 4 girls? 6M

OR

- 6 a Find the chromatic polynomial & chromatic number for  $K_{3,3}$ . 6M  
 b Define Euler circuit, Hamilton cycle, Wheel graph with examples. 6M

**UNIT IV**

- 7 What is a data mining and write its applications with suitable examples? 12M

OR

- 8** What is an operating system and explain the types of operating system with suitable examples? 12M

**UNIT V**

- 9** Explain in detail about the bioinformatics roles in mathematics. 12M

**OR**

- 10** What is a soft computing? Explain briefly its applications and techniques. 12M

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