

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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