

Reg. No:

--	--	--	--	--	--	--	--	--	--

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

MCA I Year I Semester (R16) Regular Examinations December 2016
PROBABILITY & STATISTICS

(For Students admitted in 2016 only)

Time: **3 hours**

Max. Marks: **60**

(Answer all Five Units **5 X 12 = 60** Marks)

UNIT-I

- Q.1** a. If $P(A^c) = \frac{3}{8}$, $P(B^c) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$ then find (i) $P(A/B)$
(ii) $P(B/A)$ (iii) $P(A^c/B^c)$ 6M
- b. Box **A** contains 5 red and 3 white marbles and box **B** contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same color? 6M

OR

- Q.2** a. A random variable X has the following probability function:

X:	0	1	2	3	4	5	6	7
P(X):	0	K	2K	2K	3K	K ²	2K ²	7K ² +K

- (i) Determine K (ii) Evaluate $P(X < 6)$, $P(0 < X < 5)$ (iii) Mean. 6M

- b. Is the function defined by $f(x) = \begin{cases} 0, & x < 2 \\ \frac{1}{18}(2x+3), & 2 \leq x \leq 4 \\ 0, & x > 4 \end{cases}$ a probability density

function? Find the probability that a variate having $f(x)$ as density function will fall in the interval $2 \leq x \leq 3$. 6M

UNIT-II

- Q.3** a. Find the mean and variance of Binomial Distribution. 6M
- b. The mean of a Binomial Distribution is 3 and the variance is $\frac{9}{4}$.
Find (i) the value of n (ii) $P(X \geq 7)$. 6M

OR

- Q.4** a. Given that the mean height of students in a class is 158cms with standard deviation of 20 cms. Find how many students heights lie between 150 cms and 170 cms, if there are 100 students in the class. 6M
- b. Define the Gamma Distribution and derive its mean and variance. 6M

UNIT-III

- Q.5** a. Define (i) Null Hypothesis (ii) Alternative Hypothesis (iii) Level of Significance. 6M
- b. A sample of 64 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs. 6M

OR

- Q.6** a. A random sample of six steel beams has a mean compressive strength of 58,392 p.s.i (pounds per square inch) with a standard deviation of 648 p.s.i. Use this information and the level of significance $\alpha = 0.05$ to test whether the true average compressive strength of the steel from which this sample came is 58,000 p.s.i. Assume normality. 6M
- b. A die is thrown 264 times with the following results. Show that the die is biased at 5% level.

Number appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

6M

UNIT-IV

- Q.7** A manager of a Merchandizing firm wishes to test whether its three salesmen A, B, C tend to make sales of the same size or whether they differ in their Selling abilities. During a week there have been 14 sale calls; A made 5 calls, B made 4 calls and C made 5 calls. Following are the weekly sales record (in Rs.) of the three salesmen:

A	500	400	700	800	600
B	300	700	400	600	-
C	500	300	500	400	300

Perform the analysis of variance and draw your conclusion.

12M

OR

- Q.8** A farmer applies three types of fertilizers on 4 separate plots. The figure on yield per acre are tabulated below

Plots	YIELD			
Fertilizers	A	B	C	D
Nitrogen	6	4	8	6
Potash	7	6	6	9
Phosphates	8	5	10	9

Find out if the plots are materially different in fertility, as also, if three Fertilizers make any material difference in yields.

12M

UNIT-V

- Q.9** The following data shows the values of sample mean and range for 10 samples for size 6 each. Calculate the central limits for mean chart and R- chart and draw the control charts and comment on the state of control.

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean (\bar{X})	43	49	37	44	45	37	51	46	43	47
Range (R)	5	6	5	7	7	4	8	6	4	6

12M

OR

- Q.10** a. The following figures give the number of defectives in 20 samples containing 2000 rubber belts: 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 280, 326, 389. Calculate the values for central line and the control limits for P-chart. 6M
- b. Write the construction of C- chart. 6M

***** END *****