

**Code No: 811AD**
**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**MCA I Semester Examinations, August - 2017**
**PROBABILITY AND STATISTICS**
**Time: 3hrs**
**Max.Marks:60**
**Note:** This question paper contains two parts A and B.

 Part A is compulsory which carries 20 marks. Answer all questions in Part A.  
 Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

**PART - A**
**5 × 4 Marks = 20**

- 1.a) There are 12 cards numbered 1 to 12. If two cards are selected, what is the probability that the sum is odd, if the cards are drawn.
  - i) With replacement
  - ii) Without replacement. [4]
- b) The mean and variance of binomial distribution are 4 and  $4/3$  respectively. Find  $P(x \geq 1)$ . [4]
- c) The S.D of a population is 140.5 and the sample size 50. Find the maximum error with 95% confidence. [4]
- d) The nicotene content in milligrams of two samples of tobacco were given in the following table. Find the standard error for the difference between the means at 5% level. [4]

Sample A	24	27	26	23	25	
Sample B	29	30	30	31	24	36

- e) The equations of two regression lines obtained in a correlation analysis are  $3x + 12y = 19$ ,  $3y + 9x = 46$ . Find
  - i) Coefficient of Correlation
  - ii) The means of x and y. [4]

**PART - B**
**5 × 8 Marks = 40**

- 2.a) If A and B are two events and  $P(A) = 3/5$  and  $P(B) = 1/2$ , then Prove that
  - i)  $P(A \cup B) \geq 3/5$
  - ii)  $1/10 \leq P(A \cap B) \leq 1/2$
- b) A purse contains 2 silver and 4 copper coins and a second purse contains 4 silver and 4 copper coins. A coin is selected from one of the purses and found that it is copper coin. Find the probability that it is
  - i) From purse I
  - ii) From purse-II. [4+4]

**OR**

- 3.a) What is the probability of getting two queens, if we draw two cards from a pack of 52 cards.
  - i) With replacement
  - ii) Without replacement.
- b) In a certain college 25% of the students failed in mathematics, 15 % failed in chemistry. A student is selected at random.
  - i) If he failed in Mathematics, what is the probability that he failed in Chemistry.
  - ii) If he failed in Chemistry, what is the probability that he failed in Mathematics. [4+4]



- 4.a) The probabilities of a Poisson, variate taking the values 1 and 2 are equal.  
Find i)  $\mu$  ii)  $P(x \geq 1)$
- b) In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find how many students score between 12 and 15. [4+4]

OR

5. The probability that the life of a bulb is 100- days is 0.05. Find the probability that out of 6 bulbs  
a) At least one b) None will have a life of 100 days. [4+4]
- 6.a) A sample of size 81 was taken whose variance is 20.25 and mean 32. Construct 95% confidence interval for the mean.
- b) The standard deviation of heights of students is 10 cms. A sample of 196 students was taken and the mean is 170 cms. Is this sample has been taken from a large population whose mean is 175 cms? [4+4]

OR

7. Random samples of 600 men and 900 women in a locality were asked whether they would like to have a bus stop near their residence .350 men and 475 women were in favour of the proposal. Test the significance between the difference of two proportions at 5% level. [8]
8. Four methods are under development for making discs of a super conducting material. Fifty discs are made by each method and they are checked for super conductivity when coloid with liquid nitrogen.

	Method-I	Method-II	Method-III	Method-IV
Super Conductor	31	42	22	25
Failures	19	8	28	25

Perform a Chi-square test at 0.05 level whether there is a significance difference between the proportions. [8]

OR

9. To compare the prices of a certain product in two cities, ten shops were selected at random in each town. The prices noted are given below

City I	75	89	96	101	104	110	120	123	114	115
City II	115	75	87	96	89	96	97	105	104	115

Test whether the average prices can be said to be same in the two cities. [8]

10. Fit an equation of the form  $y = ab^x$  to the following data

x	2	3	4	5	6
y	144	172.8	207.4	248.8	298.5

[8]

OR

11. The marks obtained by 10 students in Mathematics and Statistics evaluated for 50 marks are given below. Find the Coefficient of Correlation between the two subjects. [8]

Marks in Maths	25	28	30	32	35	36	38	39	42	45
Marks in Statistics	20	26	29	30	25	18	26	35	35	46

