



III Semester M.C.A. Examination, March/April 2021
(CBCS Scheme)
COMPUTER SCIENCE
MCA 304 : Statistical Analysis

Time : 3 Hours

Max. Marks : 70

Instruction : Answer any five from Part – A and any four from Part – B.

PART – A

Answer any five of the following. Each Question carries six marks. (5×6=30)

- Define the following :
 - Trail and Event
 - Independent Events
 - Mathematical Probability
- Define Random Variable. Explain the types of Random Variables. And also explain probability Mass function and Probability Density function.
- The Probability density function of a variable X is

X	1	2	3	4	5	6	7	8
P (X)	a	2a	3a	4a	5a	6a	7a	8a

Find a) Value of a b) $p(x \leq 3)$ c) $p(5 \leq x \leq 7)$

- Calculate Rank Correlation coefficient for the following data.

X	53	98	95	81	70	81	65	81
Y	25	47	82	76	53	61	75	70

- Define Poisson Distribution. If the probability that an individual suffers with a bad reaction due to a certain injection is 0.001. Determining the probability that out of 2000 individuals a) exactly 3 b) more than 2 individuals suffers with a bad reaction.
- X is Normally distributed with mean 12 and variance 16, find the probability of
 - $p(X \geq 20)$
 - $p(X < 20)$
 - $p(0 \leq X \leq 12)$

6



7. Fit a straight line to the following data

X	1	2	3	4	6	8
Y	2.4	3	3.6	4	5	6

8. Using the three yearly moving averages, determine the trend and plot the original and trend values on a graph.

Year of Production	1975	1976	1977	1978	1979	1980	1981	1982
Production in '000 units	21	22	23	24	25	26	27	28

PART – B

Answer **any four** of the following. **Each** question carries **10** marks. (4×10=40)

9. A continuous random variable has the following distribution function

$$f(x) = KX^2 \text{ if } 0 \leq x \leq 3$$

$$= 0; \text{ otherwise}$$

- a) Find K value.
- b) Computer $p(1 \leq x \leq 2)$.
- c) Find mean of the distribution.

10. Calculate Pearson Coefficient of correlation to the following data and also calculate regression equations to the given data

Price (Rs.)	10	12	13	12	16	15
Demand (units)	40	38	43	12	37	43

11. a) Derive Mean and variance of Binomial Distribution.

5

b) A large group of students took a test in Physics and the final grades have a mean of 70 and standard deviation of 10. If we can approximate the distribution of these grades by a normal distribution. What percent students

5

- i) scored higher than 80 ?
- ii) should pass the test (grades ≥ 60) ?
- iii) should fail the test (grade < 60) ?



12. a) 20 people were attacked by a disease and only 18 were survived. Will you reject the hypothesis that the survival rate of attacked by this disease is 85% in favour of the hypothesis than its more at 5% Level of Significance. **5**

b) A Random Samples of 400 men and 600 women were asked whether they would like to have a flyover near there residence. 200 Men and 325 women are in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal at 5% LOS. **5**

13. a) Fit an equation of the type $Y = ab^x$ to the following data. **5**

X	1	2	3	4	5
Y	1.6	4.5	13.8	40.2	125

b) Two sample polls of votes for two candidates A and B for a public office are taken. One from among the residents of rural areas. The results are given in the table. Examine whether the nature of the area is related to voting preference in this election. **5**

Votes of Area	A	B	Total
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

14. As a part of Investigation of the collapse of the roof of a building, a testing laboratory is given all the available bolts that are connected the steel structure at three different positions of the roof. The forces required to share each of these bolts are as follows. **10**

Position 1	90	32	79	98	83	91	
Position 2	105	89	93	104	89	95	86
Position 3	83	89	80	94			

Perform ANOVA at 0.05 LOS whether the difference among the sample means at 3 positions are significant.
