

MCOM 2004

M.Com. DEGREE EXAMINATION, JANUARY 2022.

Non-Semester / Second Year

Commerce

STATISTICAL ANALYSIS

Time : Three hours

Maximum : 100 marks

PART A — (5 × 8 = 40 marks)

Answer any FIVE questions.

1. Sakthi is known to hit the target in 3 out of 4 shots, where as Remya is known to hit the target in 2 out of 3 shots. Find the probability of the target being hit when both person try.
2. 100 car radios are inspected as they come off the production line and number of defects per set is recorded below.
No. of Defects: 0 1 2 3 4
No. of sets: 79 18 2 1 0
Fit a Poisson distribution to the above data and calculate the frequencies of 0, 1, 2, 3 and 4 defects (Given $e^{-0.25} = 0.779$).
3. 400 labourers were selected at random from a certain city. Their mean income was Rs. 1700 per month with a standard deviation of Rs.140 set up 95% confidence limits within the income of labour community of the district is expected to lie.

4. A person threw 10 dice 500 times and obtained 2560 times 4,5 to 6. Can this be attributed to fluctuations in sampling.
5. Explain a few descriptive statistics.
6. Explain sample distribution.
7. When do you use Kruskal Wallis test?
8. What is Type I and Type II error.

PART B — ($5 \times 12 = 60$ marks)

Answer any FIVE questions.

9. Explain Bayes theorem with an example
10. Researchers at a medical college have determined that children under 2 years old who sleep with the lights on have a 42% chance of becoming myopic before they are 16. Children who sleep in darkness have a 21% probability of becoming myopic. A survey indicates that 28% of children under 2 sleep with some light on. Find the probability that a child under 16 is myopic.
11. The number of accidents that occur at a busy intersection is poisson distributed with a mean of 3.5 per week. Find the probability of the following events.
 - (a) five or more accidents in one week
 - (b) one accident only.

12. State the characteristics of T-distribution.
13. From the data given below find out the following:
- (a) Two regression equations.
 - (b) Estimated value of x, when y is 34
 - (c) Estimated value of y, when x is 47
- | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|
| X | 48 | 50 | 53 | 49 | 51 | 55 | 53 | 49 |
| Y | 36 | 32 | 33 | 38 | 37 | 31 | 35 | 30 |

14. Fit a Poisson Distribution to the following
- | | | | | | |
|----|-----|----|----|---|---|
| X: | 0 | 1 | 2 | 3 | 4 |
| Y: | 123 | 59 | 14 | 3 | 1 |

15. Two random samples drawn from normal populations are
- A: 66 67 75 76 82 84 88 90 92
- B: 64 66 74 78 82 85 87 92 93 95 97

Test whether the two populations have the same variance at 5% of significance.

16. The average marks in mathematics of a sample of 100 students was 51 if a standard deviation of 6 would this have been a random sample in a population with average marks 50?