**Time : 3 Hours** 

# ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

# I SEMESTER M.Com (CBCSS-PG) DEGREE EXAMINATION, November 2024 MCM1C03 : Quantitative Techniques for Business Decisions 2024 Admission Onwards

#### Maximum Weightage : 30

#### Part A

# Short answer type questions: Answer any four questions. Weightage 2 for each question

- 1. Explain the term statistical estimation. What are the criteria for a good estimator? [BTL2]
- 2. What are the properties of a binomial distribution? Which are the situations where [BTL1] binomial distribution can be applied?
- 3. Explain sampling distribution. What are its uses? [BTL1]
- A basket contains 20 bad oranges and 80 good oranges. Three are drawn at random from this basket. Find the probability that of three

  a) exactly 2 are good
  b) at least one is good
- 5. In a correlation analysis of 13 pairs of observations of X and Y, the following values are obtained. Sum of the deviations of X and Y values are -117 and -260, sum of the squares of deviations from Xand Y values are 1313 and 6580, sum of the product of deviations of X and Y values is 2827. Find coefficient of correlation.
  [BTL3]
- 6. From the following data
  - a) Find the two regression equations

| b) Estimate the value of       | f X when | Y=75        |      |
|--------------------------------|----------|-------------|------|
|                                | Х        | Y           |      |
| Arithmetic Mean                | 36       | 85          |      |
| Standard Deviation             | 11       | 8           |      |
| <b>Correlation Coefficient</b> | between  | X and $Y =$ | 0.66 |

7. The SD of sample of size 50 is 35. Examine whether the sample was taken from a population with SD 3.2 at 1% level of significance. [BTL3]

(4x2 = 8 Weightage)

[BTL3]

# Part B

### Short essay-type questions: Answer any four questions. Weightage 3 for each question

- 8. Explain the terms
  a) one tailed and two tailed tests.
  b) standard deviation and standard error. [BTL2]
  c) level of significance and power of a test.
- 9. A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson variate with mean = 1.5. Calculate [BTL3] the proportion of days on which a) neither car is used.
  b) some demand is refused.
- 10. It is claimed that a random sample of 100 tyres with mean life of 15269 km. is drawn from a population of tyres which has a mean life of 15200 km and SD of 1248 km. Test the validity of the claim.

**Turn Over** 

| I Sales man: 7 10 14 12 6<br>II Sales man: 10 13 14 11 | 9 11 13 7 6<br>10 7 15 11<br>vel of signi | 10 9 8<br>ficance to test the null hypothesis that o                                                                  |                         |
|--------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------|
| 12. In a diet survey the follow                        | ving results                              | were obtained.                                                                                                        | [BTL1]                  |
| 2                                                      | Hindus                                    | Muslims                                                                                                               |                         |
| Families taking tea                                    | 124                                       | 16                                                                                                                    |                         |
| Families not taking tea                                | 56                                        | 10                                                                                                                    |                         |
| Is there any significant dittea?                       | fference be                               | tween the communities in the matter of                                                                                | taking                  |
| consecutive days are 8 an                              | d 6. If 500                               | ned out by the same machine on two<br>parts are turned out on each of the two<br>quantity has improved at 1% level of | days, <sub>[BTL3]</sub> |
| 14 Briefly explain the variou                          | s tools of d                              | escriptive and inferential analysis.                                                                                  | [BTL2]                  |
| ···· · ·                                               |                                           | •                                                                                                                     | 3 = 12 Weightage)       |
|                                                        |                                           | Part C                                                                                                                |                         |
| Eggen turo questiones A                                |                                           | two guartiana Weightage 5 for each an                                                                                 | antion                  |

Essay-type questions: Answer any two questions. Weightage 5 for each question

| 5. Explain the various methods of quantitative techniques.                        |        |  |  |
|-----------------------------------------------------------------------------------|--------|--|--|
| 16 In a test given to two groups of students the merics obtained ware as follows: | [BTL2] |  |  |

- 16. In a test given to two groups of students the marks obtained were as follows: [B1L2] Group I: 18 20 36 50 49 36 34 49 41
  Group II: 29 26 28 35 30 44 46
  Assuming that the group standard deviations are the same and that the marks are normally distributed, test the hypothesis that the group means are equal
- 17. From the following data relating to the number of units of production per day turned out by 5 different workers using 4 different types of machines, determine whether the mean productivity is same for the different machine types and whether the 5 men differ with respect to mean productivity.

|         |    |    | Machine | e type |
|---------|----|----|---------|--------|
| Workers | А  | В  | С       | D      |
| 1       | 44 | 38 | 47      | 36     |
| 2       | 46 | 40 | 52      | 43     |
| 3       | 34 | 36 | 44      | 32     |
| 4       | 43 | 38 | 46      | 33     |
| -       | 38 | 42 | 49      | 39     |

18. In a certain examination, the percentage of passes and distinction were 46 and 9 respectively. Estimate the average marks obtained by the candidates, the minimum pass and distinction marks being 40 and 75 respectively. Assume the distribution of marks to be normal. Also determine what would have been the minimum qualifying [BTL3] marks for admission to a re examination of the failed candidates, had it been desired that the 25% of them should be given another opportunity of being examined.

(2x5 = 10 Weightage)