

CBCS SCHEME

18MBA14

USN

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First Semester MBA Degree Examination, Aug./Sept.2020 Business Statistics and Analytics

Time: 3 hrs.

Max. Marks:100

- Note:** 1. Answer any **FOUR** full questions from Q.No.1 to 7.
2. Q.No. 8 is compulsory.
3. Use of statistical tables is permitted.

- 1 a. State the uses of correlation in business. (03 Marks)
b. Evaluate an appropriate measure of dispersion for the following data:

| Income in 'Rs.' | Less than 50 | 50-70 | 70-90 | 90-110 | 110-130 | 130-150 | Above 150 |
|-------------------|--------------|-------|-------|--------|---------|---------|-----------|
| Number of persons | 54 | 100 | 140 | 300 | 230 | 125 | 51 |

(07 Marks)

- c. Calculate mean, median and mode from the data:

| Earnings | 66-67 | 67-68 | 68-69 | 69-70 | 70-71 | 71-72 |
|----------------|-------|-------|-------|-------|-------|-------|
| No. of persons | 15 | 24 | 40 | 20 | 14 | 11 |

(10 Marks)

- 2 a. What do you mean by regression analysis? Give any two uses of it. (03 Marks)
b. Following is the details of two wheeler registrations in a city for a period of 5 years and the sale of two wheeler tyres in that city for the same period is as follows:

| Year | Two Wheelers Registrations | No. of tyres sold |
|------|----------------------------|-------------------|
| 1 | 600 | 1250 |
| 2 | 630 | 1100 |
| 3 | 720 | 1300 |
| 4 | 750 | 1350 |
| 5 | 800 | 1500 |

Find the regression equation to estimate the sale of tyres when two wheeler registrations is 850. Estimate the sale of tyres. (07 Marks)

- c. From the following data calculate the rank correlation coefficient after making adjustment for tied ranks:

| | | | | | | | | | | |
|---|----|----|----|---|----|----|----|----|----|----|
| X | 48 | 33 | 40 | 9 | 16 | 16 | 65 | 24 | 16 | 57 |
| Y | 13 | 13 | 24 | 6 | 15 | 4 | 20 | 9 | 6 | 19 |

(10 Marks)

- 3 a. Define normal distribution. (03 Marks)
b. There are 40 boys and 30 girls in a class. Four (4) students are selected at random. Find the probability that, the selected students are;
i) All Boys
ii) At the most 2(two) Boys. (07 Marks)
c. The following table gives the automobile accidents data occurred in a city. Fit a Poisson distribution. (10 Marks)

| | | | | | |
|------------------|----|----|---|---|---|
| No. of accidents | 0 | 1 | 2 | 3 | 4 |
| No. of units | 21 | 18 | 7 | 3 | 1 |

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



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- 4 a. What is meant by Time Series Analysis? (03 Marks)
 b. Define Trend. Explain the method of estimating trends. (07 Marks)
 c. You have been provided with the figures of production (in 000's tons) of a sugar factory.

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------------|------|------|------|------|------|------|------|
| Production | 77 | 88 | 94 | 85 | 91 | 98 | 90 |

- i) Fit a straight line by the method of least square and find trend values.
 ii) What is the yearly increase in production? (10 Marks)
- 5 a. Differentiate between simple and multiple regressions. (03 Marks)
 b. A person requires 10, 12 and 12 units of chemicals A, B and C respectively for his garden. A 'liquid' product contains 5, 2 and 1 units of A, B and C respectively per jar. A 'dry' product contains 1, 2 and 4 units of A, B and C per carton. If liquid product sells for Rs.3 per jar and dry product sells Rs.2 per carton, how many of each should be purchased in order to minimize the cost and meet the requirements. (07 Marks)
 c. Solve the LPP by graphical method:
 Minimize $Z = 40x_1 + 24x_2$
 Subject to constraints: $20x_1 + 50x_2 \geq 4800$
 $80x_1 + 50x_2 \geq 7200$
 $x_1, x_2 \geq 0$ (10 Marks)

- 6 a. What is mean by Merge and Burst event? (03 Marks)
 b. Explain the common errors in drawing networks. (07 Marks)
 c. Given below are the time estimates for various activities of a project.

| Activity | Optimistic (t_o) (weeks) | Most likely (t_n) (weeks) | Pessimistic (t_p) (weeks) |
|----------|------------------------------|-------------------------------|-------------------------------|
| 1-2 | 2 | 5 | 8 |
| 1-3 | 1 | 4 | 7 |
| 2-3 | 9 | 9 | 15 |
| 2-4 | 6 | 9 | 12 |
| 3-5 | 8 | 11 | 14 |
| 3-6 | 9 | 12 | 15 |
| 4-5 | 6 | 9 | 12 |
| 5-6 | 2 | 5 | 8 |
| 6-7 | 3 | 3 | 9 |

- i) Identify the critical path and estimate its duration.
 ii) Estimate the S.D. of the critical path [standard deviation].
 iii) What is the probability that project would be completed in 32 weeks? (10 Marks)
- 7 a. What is meant by project scheduling? (03 Marks)
 b. Define and differentiate between PERT and CPM. (07 Marks)
 c. Define LPP. Explain its advantages and limitations. (10 Marks)

CASE STUDY

- 8 Determine Initial Basic Feasible Solution [IBFS] using:
 a. North West Corner Rule – NWCR
 b. Least Cost Method – LCM
 c. Vogel Approximation Method – VAM.
 Also test for the optimal solution through; MODI – Modified Distribution Method.

| | D ₁ | D ₂ | D ₃ | D ₄ | Availability |
|-------------|----------------|----------------|----------------|----------------|--------------|
| | 2 | 3 | 11 | 7 | 6 |
| | 1 | 0 | 6 | 1 | 1 |
| | 5 | 8 | 15 | 9 | 10 |
| Requirement | 7 | 5 | 3 | 2 | |

(20 Marks)
