18MBA14

USN

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

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)

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