CBCS SCHEME

USN | | | | | | | | | | |

18MBA14

First Semester MBA Degree Examination, June/July 2019
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 table is permitted.

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.

1 a. What is looping and dangling in network? **(03 Marks)**

b. Bring out some special cases in linear programming problem, with an illustration. **(07 Marks)**

c. Calculate Karl Pearson's coefficient of correlation for the data given below taking 66 and 63 as assumed means of X and Y respectively.

Height of husbands in inches [X]	: 60	62	64	66	68	70	72
Height of Wives in inches [Y]	: 61	63	63	63	64	65	67

(10 Marks)

2 a. Bring out the utility of time series analysis. **(03 Marks)**

b. 1000 light bulbs with a mean life of 120 days are installed in a new factory and then length of life is normally distributed with standard deviation of 20 days.

i) How many bulbs will expire in less than 90 days?

ii) If it is decided to replace all the bulbs together, what interval should be allowed between replacements, if not more than 10 percent should expire before replacement? **(07 Marks)**

c. From the following data obtained the two regression equations and calculate correlation coefficient:

X:	1	2	3	4	5	6	7	8	9
Y:	9	8	10	12	11	13	14	16	15

Estimate the value of Y which should correspond on an average to X = 6.2. **(10 Marks)**

3 a. List out the classification of probability distribution function. **(03 Marks)**

b. The following table gives the number of days in a 50-day period during which automobile accidents occurred in a city:

Number of accidents:	0	1	2	3	4
Number of days:	21	18	7	3	1

Fit a poisson distribution to the data. **(07 Marks)**

c. You are given below the daily wages paid to the workers in two factories X and Y:

Daily Wages	Number of Workers	
	Factory X	Factory Y
12-13	15	25
13-14	30	40
14-15	44	60
15-16	60	35
16-17	30	12
17-18	14	15
18-19	07	05

Using appropriate measures answer the following:
i) Which factory pays higher average wage?
ii) Which factory has a more consistent wage structure? **(10 Marks)**

4 a. Enumerate the different types of correlation. **(03 Marks)**

b. The following table relates to the tourist arrivals (in million) during 2001 to 2007 in India:

Years:	2001	2002	2003	2004	2005	2006	2007
Tourist Arrivals [in millions]	18	20	23	25	24	28	30

Fit a straight line trend by the method of least squares and estimate the number of tourists that would arrive in the Year 2011. **(07 Marks)**

c. Calculate median and mode of the given data below. Using them find arithmetic mean.

Marks:	10	20	30	40	50	60
Number of students:	8	23	45	65	75	80

(10 Marks)

5 a. What is degeneracy? **(03 Marks)**

b. Particulars of regarding the income of two villages are given below:

	Village X	Village Y
Number of people	600	500
Average Income (Rs)	175	186
Variance of Income (Rs)	100	81

i) In which village is the variation in income greater?
ii) What is the combined standard deviation of the village X and village Y put together? **(07 Marks)**

c. A brokerage survey reports that 30 percent of individual investors have used a discount broker, i.e., one which does not charge the full commission. In a random sample of 9 individuals, what is the probability that.
i) Exactly two of the sampled individuals have used a discount broker?
ii) Not more than three have used a discount broker.
iii) At least three of them have used a discount broker. **(10 Marks)**

6 a. Based on the purpose of measuring, the measurement of dispersion is classified in two categories. Explain briefly each category. **(03 Marks)**

b. Solve graphically the following L.P.P.

Maximize $Z = 0.07x_1 + 0.10x_2$

Subject to $x_1 + x_2 \leq 30{,}000$

$x_1 \geq 6{,}000$

$x_2 \leq 12{,}000$

$x_1 - x_2 \geq 0$

$x_1, x_2 \geq 0$ **(07 Marks)**

c. Draw a network corresponding to the following information. Obtain the early and late start time, early and late finish time. Determine the critical activities and project completion time:

Activity	1-2	1-3	2-6	3-4	3-5	4-6	5-6	5-7	6-7
Duration	4	6	8	7	4	6	5	19	10

(10 Marks)

7 a. List out the different types of averages. **(03 Marks)**

b. The agriculture research institute suggested to a farmer to spread out at least 4800 kg of a special phosphate and not less than 7200kg of special nitrogen fertilizer to raise productivity of Crop's in his fields. There are two sources for obtaining these - Mixture A and Mixture B. Both of these are available in bags weighing 100kg each and they cost Rs.40 and Rs.24 respectively. Mixture A contains phosphate and nitrogen equivalent of 20kg and 80kg respectively, while Mixture B contains these ingredients equivalent of 50kg each. Formulate linear programming problem to determine how many bags of each type the farmer should buy in order to obtain the required fertilizer at min cost. **(07 Marks)**

c. A small project is composed of activities. Whose time estimates are listed in the table below [in weeks]:

Activity	Estimated Duration		
	Optimistic	Most Likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

i) Draw the network diagram and its activities in project and find critical path and variance.

ii) What is the expected project length./

iii) Find out the probability of completing the project at least 4 weeks later than expected time. **(10 Marks)**

8 Solve the given transportation problem for initial basic feasible solution.

From \ To	P	Q	R	S	Supply
A	12	10	12	13	500
B	7	11	8	14	300
C	*6*	*16*	*11*	*7*	*200*
Demand	180	150	350	320	

Find the transportation cost by using

a. VAM Method **(10 Marks)**

b. LCM Method. **(10 Marks)**

* * * * *