

# CBCS SCHEME

18MBA14



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## First Semester MBA Degree Examination, Dec.2019/Jan.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.**

- 1 a. Give the importance of statistics in Business and Management. (03 Marks)  
 b. The following table gives the weights of 31 persons in a sample enquiry. Calculate the mean weight using i) Geometric mean and ii) Harmonic mean.

Weights (lbs)	: 130	135	140	145	146	148	149	150	157
No of persons	: 3	4	6	6	3	5	2	1	1

- c. Goals scored by two teams A and B in a football season were as shown in the below table. By calculating the coefficient of variation in each case, find which team is more consistent:

No of goals scored in a match	No of matches	
	A team	B team
0	27	17
1	9	9
2	8	6
3	5	5
4	4	3

- 2 a. List the measures of central tendency. Also give their uses. (03 Marks)  
 b. Calculate Spearman's rank correlation coefficient between advertisement cost and sales from the following data:

Ad cost ('000 Rs.)	: 39	65	62	90	82	75	25	98	36	78
Sales (lakhs Rs.)	: 47	53	58	86	62	68	60	91	51	84

- c. From the data given below find  
 i) The two regression coefficients  
 ii) The two regression equations  
 iii) The coefficient of correlation between the marks in economics and statistics.  
 iv) The most likely marks in statistics when marks in economics are 30.

Marks in Economics	: 25	28	35	32	31	36	29	38	34	32
Marks in statistics	: 43	46	49	41	36	32	31	30	33	39

- 3 a. The following table gives the age distribution of a group of 50 individuals:

Age (in years)	: 16-20	21-25	26-30	31-36
No. of persons:	10	15	17	8

- Calculate range and the coefficient of range. (03 Marks)  
 b. What is correlation? Explain the types of correlation. (07 Marks)  
 c. From the following table calculate the coefficient of correlation by Karl Pearson's method.

x	6	2	10	4	8
y	9	11	?	8	7

Arithmetic means of x and y series are 6 and 8 respectively.

(10 Marks)

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 regression analysis? Distinguish between simple and multiple regressions. (03 Marks)  
 b. Compute the seasonal index for the following data assuming that there is no need to adjust the data for the trend. (07 Marks)

Quarter	1990	1991	1992	1993	1994	1995
1	3.5	3.5	3.5	4.0	4.1	4.2
2	3.9	4.1	3.9	4.6	4.4	4.6
3	3.4	3.7	3.7	3.8	4.2	4.3
4	3.6	4.8	4.0	4.5	4.5	4.7

- c. A systematic sample of 100 pages was taken from the Oxford Dictionary and the observed frequency distribution of foreign words per page was found to be as follows:

No. of foreign words per page (x):	: 0	1	2	3	4	5	6
Frequency (f)	: 48	27	12	7	4	1	1

Calculate the expected frequencies using Poisson distribution.

(10 Marks)

- 5 a. What is a random variable? Give the difference between discrete and continuous random variable. (03 Marks)  
 b. The average test marks in a particular class is 79. The standard deviation is 5. If the marks are distributed normally, how many students in a class of 200 did not receive marks between 75 and 82?  
 Given:  $P(0 \leq z \leq .7) = 0.2580$   $P(0 \leq z \leq .8) = 0.2881$   $P(0 \leq z \leq .6) = 0.2257$   
 Where Z is a standard normal variable. (07 Marks)  
 c. The following table shows the age distribution of persons in a particular region:

Age (years)	No of persons (in thousands)
Below 10	2
Below 20	5
Below 30	9
Below 40	12
Below 50	14
Below 60	15
Below 70	15.5
70 and over	15.6

- i) Find the median age  
 ii) Why is the median a more suitable measure of central tendency than the mean in this case? (10 Marks)

- 6 a. Four cards are drawn at random from a pack of 52 cards. Find the probability that:  
 i) They are a king, a queen, a jack and an ace  
 ii) Two are kings and two are aces  
 iii) All are diamonds. (03 Marks)

- b. What is time series analysis? Explain the uses of it. (07 Marks)

- c. A project has the following activities:

Activity:	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Duration (days) :	2	4	3	1	6	5	7

- i) Draw the network diagram  
 ii) Find critical path and total project duration  
 iii) Find earliest start time, latest start time, earliest finish time and latest finish time. (10 Marks)



- 7 a. What are looping and dangling errors in network? (03 Marks)  
 b. Find the basic feasible solution for the following transportation problem using VAM:

Origin \ Destination	I	II	III	IV	Supply
A	4	6	8	13	50
B	13	11	10	8	70
C	14	4	10	13	30
D	9	11	13	8	50
Demand	25	35	105	20	

(07 Marks)

- c. Fit a linear trend to the following data by the least squared method:

Year	: 1990	1992	1994	1996	1998
Production (in '000 units)	: 18	21	23	27	16

Also estimate the production for the year 1999.

(10 Marks)

- 8 a. Find the initial basic feasible solution for the given transportation problem using.  
 i) Northwest corner method  
 ii) Least cost method.

Plant	Distribution centre				Supply
	P	Q	R	S	
A	12	10	12	13	500
B	7	11	8	14	300
C	6	16	11	17	200
Demand	180	150	350	320	1000

(10 Marks)

- b. Use the graphical method to solve the following LPP:

$$\text{Maximize } Z = 40x_1 + 80x_2$$

Subject to Constraints

$$(i) 2x_1 + 3x_2 \leq 48$$

$$(ii) x_1 \leq 15$$

$$(iii) x_2 \leq 10$$

$$\text{and } x_1, x_2 \geq 0$$

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(10 Marks)

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