CBCS SCHEME

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16/17MBA14

First Semester MBA Degree Examination, Jan./Feb. 2021
Quantitative Methods

Time: 3 hrs. Max. Marks:80

Note: 1. ***Answer any Four questions from Q.No. 1 to Q.No. 7.***
2. ***Question No. 8 is compulsory.***
3. ***Use of Statistical table is permitted.***

1 a. List out the different types of Averages. **(02 Marks)**

b. Enumerate three types of decision making environment in brief. **(06 Marks)**

c. Calculate arithmetic Mean, Median and Mode from the following frequency distribution :

Variables	10-13	13-16	16-19	19-22	22-25	25-28	28-31	31-34	34-37	37-40
Frequency	8	15	27	51	75	54	36	18	9	7

(08 Marks)

2 a. What do you mean by degeneracy in transportation? **(02 Marks)**

b. Bring out the striking difference between PERT and CPM. **(06 Marks)**

c. There are 12 clerks working in a office. The long servicing clerk feels that they should get seniority increment based on length of service built into their salary structure. Based on the assessment of their efficiency by the HR department a ranking of efficiency was developed. The ranking of efficiency together with a ranking of their length of service is as follows :

Ranking according to length of service	1	2	3	4	5	6	7	8	9	10	11	12
Ranking according to efficiency	2	3	5	1	9	10	11	12	8	7	6	4

Do the data support the clerks claim for seniority increment? **(08 Marks)**

3 a. Bring out the striking difference between mean deviation and standard deviation. **(02 Marks)**

b. Suppose 10 percent of new scooters will require warranty service within first month of its sale. A scooter manufacturing company sells 1000 scooters in a month.
Find the mean and standard deviation of scooters that require warranty service. **(06 Marks)**

c. Height of the fathers and sons are given below. Find the height of the son when the height of the father is 70 inches. **(08 Marks)**

Father (Inches)	71	68	66	67	70	71	70	73	72	65	66
Son (Inches)	69	64	65	63	65	62	65	64	66	59	62

4 a. State the rules for construction of a project network. **(02 Marks)**

b. Enumerate the important steps in decision making process in brief. **(06 Marks)**

c. From the prices of shares of X and Y, find out which is more stable in value. **(08 Marks)**

X :	35	54	52	53	56	58	52	50	51	49
Y :	108	107	105	105	106	107	104	103	104	101

5 a. What do you mean by Project Crashing? **(02 Marks)**

b. Briefly explain : i) Multiple optimal solution ii) Unbounded solution
iii) Inflexible solution. **(06 Marks)**

c. Solve graphically the following LPP.
Maximize $Z = 8x_1 + 16x_2$
Subject to $x_1 + x_2 \leq 200$
$x_2 \leq 125$
$3x_1 + 6x_2 \leq 900$; $x_1, x_2 \geq 0$. **(08 Marks)**

6 a. List out the various methods used for studying correlation. **(02 Marks)**

b. A firm is engaged in producing two products A and B. Each unit of product A requires 2 kg of raw material, 4 labour hours and Product B requires 3 kg of raw material and 3 hours of labour. Each products are required to be packed. Every unit of A requires 4 hours while unit of product B needs 3.5hrs for packaging. Every week, the firm has an availability of 60kg of raw material and 96 labour hours. In packaging department 105 hrs are available every week. One unit of product A sold yields Rs 40 and one unit of product B sold gives Rs 35 as profit. Formulate this problem as a LPP to determine as to how many units of each of the products should be produced per week. So that the firm can earn the maximum profit. **(06 Marks)**

c. For a project consisting of several activities, the duration and required resources of carrying out each of the activities and their availabilities are given below :

Activity	1-2	1-3	1-4	2-4	2-5	3-4	3-5	4-5
Duration	4	3	6	4	8	4	4	6

i) Draw a network, identity critical path and compute the total float for each of the activities and Early start , Early finish, Late start and Late finish.

ii) Find the project completion time under the given resource constraints. **(08 Marks)**

7 a. Define Binomial Probability distribution. **(02 Marks)**

b. Briefly explain three broad types of correlations. **(06 Marks)**

c. A project consists of nine activities whose time estimates (in weeks) are given below :

Time Estimates

Activity	Most optimistic	Most likely	Most pessimistic
1 - 2	2	4	6
1 - 3	6	6	6
1 - 5	6	12	24
2 - 3	2	5	8
2 - 4	11	14	23
3 - 5	8	10	12
3 - 6	3	6	9
5 - 6	9	15	27
4 - 6	4	10	16

i) Draw a network and identify critical activities.

ii) What is the expected project completion time and its variance?

iii) What is the probability of completing the project one week before the expected time? **(08 Marks)**

8 **Compulsory** :

A firm own's facilities at seven places. It has manufacturing plants at places A, B and C with daily output of 500, 300 and 200 units of an item respectively. It has warehouses at places P, Q, R and S with daily requirements of 180, 150, 350 and 320 units respectively. Per unit charges (shipping) on different routes are given below :

From \ To	P	Q	R	S
A	12	10	12	13
B	7	11	8	14
C	6	16	11	7

The firm wants to send the output from various plants to warehouses involving minimum transportation cost. Solve the problem by using

i) Least Cost Method [LCM]. **(08 Marks)**

ii) Vogel's Approximation Method [VAM]. **(08 Marks)**

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