CBCS Scheme

USN | | | | | | | | | | 16/17MBA14

First Semester MBA Degree Examination, Dec.2017/Jan.2018
Quantitative Methods

Time: 3 hrs. Max. Marks:80

Note: *1. Answer any FOUR full questions from Q1 to Q7.*
2. Question No. 8 is compulsory.

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 the arithmetic mean? What is a disadvantage of the arithmetic mean? **(02 Marks)**

b. Construct a scatter plot for the data obtained in a study of age and blood pressure of six randomly selected people. The data are shown in the table. **(06 Marks)**

Subject	Age	Pressure
A	43	128
B	48	120
C	56	135
D	61	143
E	67	141
F	70	152

c. The mean of the number of sales of cars over a 3 month period is 87, and the standard deviation is 5. The mean of the commissions is Rs. 5225, and the standard deviation is Rs. 773. Compare the variations of the two. State the conclusions drawn. **(08 Marks)**

2 a. What is linear programming? What types of problems is it used to solve? **(02 Marks)**

b. Calculate the mean and the standard deviation of the number of horses found in 50 farms in Australia. **(06 Marks)**

Number (X)	Frequency (f)
120 – 130	2
130 – 140	5
140 – 150	25
150 – 160	10
160 – 170	8

c. Compute the value of the correlation coefficient for the following data. The data was obtained in the study of the number of absences and the final grade of seven students in a management class. Write an appropriate conclusion as to the relationship between the 2 variables which are absence and grade.

Student	Absences (x)	Grade (y)
A	6	82
B	2	86
C	15	43
D	9	74
E	12	58
F	5	90
G	8	78

(08 Marks)

3 a. What do you mean by the term correlation? Why do we calculate regression? **(02 Marks)**

b. Briefly explain the steps of the decision making process. **(06 Marks)**

c. Find the modal class and mode for the data in the table below :

Number	Frequency
1 – 3	7
4 – 6	6
7 – 9	4
10 – 12	9
13 – 15	2
16 – 18	8
19 – 21	1
22 – 24	2
25 – 27	3
28 - 30	2

(08 Marks)

4 a. What is a decision tree? What are the nodes and the branches? **(02 Marks)**

b. If there are 2200 typographical errors randomly distributed in a 500 page manuscript, find the probability that a given page contains exactly three errors. [Given : e = 2.7183]. **(06 Marks)**

c. The ranking of 10 researchers in 2 projects A and B are as follows. Find the rank correlation.

A	B
6	3
5	8
3	4
10	9
2	1
4	6
9	10
7	7
8	5
1	2

(08 Marks)

5 a. What is decision theory? How does it help the decision maker? **(02 Marks)**

b. Explain three common errors in drawing networks using suitable diagrams. **(06 Marks)**

c. Consider the following linear programming problem :

Maximize $3x + 4y$

Constraints ; $2x + 3y \leq 12$

$4x + 2y \leq 16$

$x, y \geq 0$

Find the optimal points using the graphical solution procedure. Find the optimal solutions. What is the value of the objective functions? **(08 Marks)**

6 a. What is a Poisson distribution? What is the formula to calculate probability? **(02 Marks)**

b. Find the area under a standard normal curve between $z = -0.75$ and $z = 2.04$. **(06 Marks)**

c. A project consists of the following activities. The table below provides the list of activities, their duration in weeks and the immediate predecessors.

Activity	Duration (weeks)	Immediate Predecessors
A	9	–
B	2	A
C	3	A
D	7	B and C
E	6	D
F	1	E
G	4	D
H	5	G and F

i) Draw a network diagram to represent the project

ii) Calculate the earliest completion time for the project

iii) Determine the critical path.

(08 Marks)

7 a. When the critical path method is used in project management, what is meant by the term 'Critical Path' and what is the significance of the critical path of the network? **(02 Marks)**

b. What are the advantages and disadvantages of linear programming? **(06 Marks)**

c. Solve the following transportation problem using North-West corner method. Check if there exists a feasible solution. If so calculate the transportation cost?

	A1	A2	A3	A4	Supply
F1	19	30	50	10	7
F2	70	30	40	60	9
F3	40	8	70	20	18
Demand	5	8	7	14	34

(08 Marks)

8 CASE STUDY [Compulsory]

a. Find an optimal transportation cost for transporting the products at a minimum cost for the following problem using Vogel's Approximation Method (VAM).

Source	Destination			Supply
	D1	D2	D3	
S1	6	4	1	50
S2	3	8	7	40
S3	4	4	2	60
Demand	20	95	35	150

(08 Marks)

b. A farmer can plant up to 8 acres of land with wheat and barley. He can earn Rs. 5,000 for every acre he plants with wheat and Rs. 3000 for every acre he plants with barley. His use of a pesticide is limited by regulations to 10 liters for his entire 8 acres. Wheat requires 2 liters of pesticide for every acre planted and barley requires just 1 liter per acre. Formulate this as a linear programming problem so as to maximize the total profit. Solve the problem using graphical method.

(08 Marks)

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