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

14MBA14

First Semester MBA Degree Examination, June/July 2016
Business Analytics

Time: 3 hrs. Max. Marks:100

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.

SECTION - A

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

1 What do you mean by regression Analysis? Give any 2 uses of it. **(03 Marks)**

2 What is an unbalanced Transportation problem? Give an example. **(03 Marks)**

3 What is Binomial distribution? Write the formula to calculate probability. **(03 Marks)**

4 Explain Single Factor Experiment. **(03 Marks)**

5 Explain the assumptions of Linear programming model. **(03 Marks)**

6 What is a Decision model? Explain. **(03 Marks)**

7 What is cluster Analysis? Explain. **(03 Marks)**

SECTION - B

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

1 Explain briefly the different types of Decision making environments. **(07 Marks)**

2 Explain the basic difference between PERT and CPM. **(07 Marks)**

3 What is Multi Dimensional Scaling? Explain the steps. **(07 Marks)**

4 Solve the following LPP using Graphical method.
Minimize $Z = 20x_1+10x_2$
Subject to the constraints
$x_1 + 2x_2 \leq 40$
$3x_1 + x_2 \geq 30$
$4x_1 + 3x_2 \geq 60$
$x_1, x_2 \geq 0$ **(07 Marks)**

5 Four different jobs can be done on four different machines. The cost of producing Job 'j' on machine 'm' is given below. How should the jobs be assigned to various machines so that the total cost is minimized?

		Machines			
		M_1	M_2	M_3	M_4
Jobs	J_1	5	7	11	6
	J_2	8	5	9	6
	J_3	4	7	10	7
	J_4	10	4	8	3

(07 Marks)

6 A Project yields an average cash flow of ₹ 500 lakhs, with a standard deviation of ₹ 60 lakhs, Calculate the following probabilities.

a) Cash flow will be more than 560 lakhs

b) Cash flow will be less than 420 lakhs. **(07 Marks)**

7 The following table gives the activities in a construction project.

Activity	Immediate predecessor	Time (days)
A	-	4
B	-	6
C	-	2
D	A	5
E	C	2
F	A	7
G	D, B, E	4

a) Draw a network diagram

b) Determine critical path and project duration. **(07 Marks)**

SECTION - C

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

1 Explain the rules to be followed during the construction of network and the common errors occurred during the construction. **(10 Marks)**

2 Explain the various aspects of "Data for Business Analytics"? **(10 Marks)**

3 A small project is composed of 7 activities whose time estimates are as given below.

	Estimated duration (weeks)		
Activity	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

a) Draw the project network diagram.

b) Find the expected duration and variance of each activity. What is the expected project length and project standard deviation?

c) Calculate the probability of completing the project by 13 weeks. **(10 Marks)**

4 A sample of 50cars each of 2makes X and Y is taken and average running life in years is recorded.

Life (No. of Years)	No. of Cars	
	Make X	Make Y
0 – 5	8	6
5 – 10	12	10
10 – 15	17	20
15 – 20	10	12
20 – 25	3	2

a) Which of these two makes gives higher average life?

b) Which of these makes has shown greater consistent performance? Use standard deviation. **(10 Marks)**

5 The following data gives the experience of machine operators and their performance ratings.

Operator	1	2	3	4	5	6	7	8
Experience (in years)	16	12	18	4	3	10	5	12
Performance Ratings	87	88	89	68	78	80	75	83

Calculate the regression line of performance rating on experience and estimate the probable performance rating if an operator has 7 years of experience. **(10 Marks)**

6 Explain briefly the steps in undertaking cluster Analysis. **(10 Marks)**

7 An investment company has ₹ 20 lakhs available for investment in government bonds, blue chip stocks, speculative stocks and short term deposits. The annual expected return and risk factor are given below.

Type of Investment	Annual Expected Return (%)	Risk Factor (0 – 100%)
Government Bonds	14	12
Blue chip stocks	19	24
Speculative stocks	23	48
Short term Deposits	12	6

The company is required to keep at least ₹ 2 lakhs in short term deposits, average risk factor should not exceed 42 ; speculative stocks must be at most 20 percent of total amount invested. How should the company invest funds so as to maximize its total expected annual return? Formulate a LPP. **(10 Marks)**

SECTION - D
CASE STUDY – [Compulsory]

8 a) For the following Transportation problem find initial solution using
i) North west corner method ii) Least cost method

		To			
		I	II	III	Supply
From	A	5	1	7	10
	B	6	4	9	80
	C	3	2	8	55
Demand		75	20	50	

(10 Marks)

b) A company has 3 fabrics S_1, S_2 and S_3 with production capacity of 7, 9 and 18 units (in100s) per week of a product respectively. These units are to be shipped to four warehouses D_1, D_2, D_3 and D_4 with requirement of 5, 8, 7 and 14 units (in 100s) per week respectively. The transportation costs (in Rupees) per unit between factories to warehouses are given below.

	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	

i) Find initial solution using VAM method
ii) Test for optimality using MODI method. **(10 Marks)**

* * * * *