I Semester M.B.A. Degree Examination, February 2016
(2007-2008 Scheme)
MANAGEMENT
Paper – 1.5 : Business Mathematics and Analytics

Time : 3 Hours   Max. Marks : 75

*Instruction : Calculators and appropriate statistical tables are **allowed**.*

SECTION – A

Answer **any six** sub questions. **Each** sub question carries **two** marks.   (6×2=12)

1. a) What are measures of central tendency ?

   b) What is kurtosis ?

   c) What is Poisson's distribution ?

   d) What is Baye's theorem ?

   e) What is uncertainty and risk ?

   f) What is meant by confidence level ?

   g) What is lag and lead in correlation ?

   h) What is the linear trend ?

SECTION – B

Answer **any three** questions. **Each** question carries **eight** marks.   (3×8=24)

2. What are non parametric tests ? Explain in detail with their managerial applications.

3. a) If $A = \begin{vmatrix} 6 & -3 & 2 \\ 8 & 3 & -1 \\ 1 & -4 & 2 \end{vmatrix}$, $B = \begin{vmatrix} 3 & 2 & 4 \\ 1 & 6 & 9 \\ 8 & 3 & 2 \end{vmatrix}$ and $C = \begin{vmatrix} -1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$. Find $3A + 2B - C$.

   b) In a class of 150 students appearing for a test, the mean marks they got were 60. If the variance was 36, find how many students got,

   a) Between 70 and 75 marks ?

   b) Between 55 and 58 marks ?

   c) Above 72 marks ?

   d) Less than 53 marks ?

4. A training school imparted disaster management skills to local citizens in a certain city. A survey was undertaken to find whether citizens found these skills useful and helped during a local fire. Based on the data collected and given below and using chi square analysis with a significance level of 5 per cent, determine whether the said training schools attempts at training were effective or not.

Details	Helped in crisis	Did not help in crisis	Total
Trained	850	760	1610
Not trained	630	542	1172
Total	1480	1302	2782

5. Find the straight line trend from the following data and forecast the sales figures for the next two years of a certain corporation.

Year	2006	2007	2008	2009	2010	2011	2012	2013
Sales in 00,000 Rs.	167	189	210	194	186	220	225	238

A graph is necessary.

6. What is meant by a null hypothesis ? How is it set up ? Explain the procedure for setting up a hypothesis, by explaining with necessary illustrations, the concepts of one tailed and two tailed tests, significance levels of 1 per cent and five per cent and the Type I and Type II errors.

SECTION – C

Answer **any two** questions. **Each** question carries **twelve** marks. (2×12=24)

7. Construct index numbers of price and quantity through the following methods :

a) Laspeyer's   b) Paasche

c) Fischer   d) Marshall Edgeworth

e) Kelly.

Prove that the Fischer's ideal index satisfies the time reversal and factor reversal tests, with the below given data :

Commodity	p_0	p_1	q_0	q_1
A	6	9	8	9
B	19	20	10	10
C	24	25	12	14
D	16	22	15	15
E	30	32	20	22
F	25	26	20	21

8. a) For the data given below, find the coefficient of correlation. Find the probable error and determine the significance of the correlation. Also find the range within which the correlation coefficient may lie.

Age	18	24	30	45	50	60	75
Motor Neuro Skills in digits	142	144	150	140	140	130	120

   b) Find the two regression equations for the following data. Also find the name of Y when X = 25 and 30. Find the value of X when Y = 124 and 118.

X	27	29	34	32	36	38	42
Y	110	115	112	110	120	125	130

9. a) What is sampling ? Explain the different sampling methods with their managerial applications.

   b) A team leader needs to be selected from among the members of a team. The members of the team consist of ten people with the following profits

   1) Lady aged 40 years.

   2) Man, aged 35 years.

   3) Man, aged 25 years.

   4) Man, aged 50 years.

   5) Lady aged 30 years.

   6) Lady, aged 38 years.

   7) Man, aged 28 years.

   8) Man, aged 45 years.

   What is the probability that the team leader will be

   a) a lady, aged above 35 years ?

   b) a man, aged above 40 years ?

   c) a man aged less than 38 years ?

SECTION – D

This Section is **compulsory**. (1×15=15)

10. Mr. A has three investment options, but he can undertake only one at a time :

Option A : He can open a departmental store with an investment of Rs. 10 lakhs. The cash inflow will be Rs. 25 lakhs with a probability of success of 85 per cent. If he fails, he can still salvage Rs. 5 lakhs. Upon succeeding he can invest in a bakery with an investment of Rs. 8 lakhs. His chances of success are 80 per cent with a cash inflow of Rs. 9 lakhs. If he fails he can still save Rs. 4 lakhs.

Option B : He can open a gift shop with an investment of Rs. 5 lakhs. His chances of success are 75 per cent with a cash inflow of Rs. 8 lakhs. If he fails he can still save Rs. 4 lakhs. If he succeeds he can open a second gift shop with an investment of Rs. 6 lakhs. His chances of success are 60 per cent with a cash inflow of Rs. 7 lakhs. If he fails, he recovers nothing.

Option C : He can open a shoe shop with an investment of Rs. 9 lakhs. His chances of success are high with 70 per cent and cash inflow of Rs. 13 lakhs ; Medium with 25 per cent and cash inflow of Rs. 11 lakhs and save with cash inflow of Rs. 10 lakhs. With high success, he can open another shoe shop with an investment of Rs. 6 lakhs. The chances of success are 90 per cent with a cash inflow of Rs. 8 lakhs. If he fails, he still salvages Rs. 3 lakhs. Draw up a decision tree, the Pay off Table and advice Mr. A on his actions.

_____