

**I Sem. M.B.A. Examination, January 2008**  
**(2007-08 Scheme)**  
**Paper – 1.5 : BUSINESS ADMINISTRATION**  
**Business Mathematics and Analytics**

Time : 3 Hours

Max. Marks : 75

*Instruction : Calculators and tables are allowed*

SECTION – A

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

1. a) What is dispersion ? What is the purpose of a measure of dispersion ?
- b) What is skewness ? What are the different measures of skewness ?
- c) How will you interpret the sign and magnitude of a correlation coefficient ?
- d) List the chief properties of a normal distribution.
- e) What is a sign test ? When is it used ?
- f) In which context is the Mann Whitney U Test used ?
- g) What is kurtosis ? Explain the three different curves under kurtosis.
- h) What is Binomial distribution ? What are its business applications ?

SECTION – B

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

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

find  $2A + 4B$ .

- b) Explain the method of moving averages in calculating the trend. What are the merits and limitations of this method ?
3. a) Fit a straight line trend by the method of least squares to the following data and project the production for the next two years : (A graph is not necessary).

Year	2002	2003	2004	2005	2006
Production in metric tons	45	45	47	48	52

P.T.O.

b) A candidate has to be selected for a managerial post with the following characteristics :

An MBA degree (probability of getting such a candidate is one in hundred).

Excellent communication skills (probability is one in fifty).

Knowledge of a foreign language (probability is one in eighty).

Experience of working as a manager (probability of getting such a candidate is one in 20).

Find the probability of getting the required candidate.

4. KMF wishes to test whether the preference pattern of Bangalore consumers for different kinds of milk is dependent on income levels. A random sample of 1200 consumers gives the following data. Use the chi square test and determine whether the preference patterns are independent of income levels.

Income	Type of milk preferred		
	Low fat	Medium fat	High fat
Low	100	225	25
Medium	125	75	150
High	75	150	275

5. a) Explain the procedure of setting up and testing a hypothesis.

b) An aptitude test for selecting Management Trainees was conducted on 5000 candidates. The average score was 56 and the standard deviation was 24. Assuming normal distribution for the scores, find :

a) The number of candidates whose scores exceeded 85.

b) Candidates who scored between 65 and 70.

c) Candidates who scored less than 50.

d) Candidates who scored 60.

6. Find Karl Pearson's coefficient of correlation, the probable error and comment on the significance of correlation for the following data :

Advertisement expenses in 00,000 Rs.	15	18	19	20	22	24	25
Sales in 00,000 Rs.	24	26	26	27	28	28	30

SECTION - C

Answer any 2 questions. Each question carries 12 marks.

(2×12=24)

7. What is business forecasting ? Explain the various techniques of forecasting. Explain the major steps in forecasting. What are the limitations of forecasting ?
8. a) What is a decision tree ? What are the steps in decision tree analysis ?  
 b) A manufacturer is faced with 2 alternatives about his products :  
 A) Modify existing product or  
 B) Produce and market a new product.  
 The consequences of the above are :

Alternative	Initial demand Probability		Pay off on high demand
	High	Low	
A	0.6	0.4	5 lakhs
B	0.5	0.5	7 lakhs

The first stage choice leads to further choices only when the demand turns out to be low. Details of this second stage are :

I Stage choice	II Stage alternative	Final Demand	Probability	Pay off Rs. in lakhs
A	Reduce price	Low	0.3	0.4
		High	0.7	1.7
	Increase price	Low	0.8	0.6
		High	0.2	2.25
B	Reduce price	Low	0.2	0.50
		High	0.8	1.25
	Increase price	Low	1.0	0.80
		High	0	2.00

Construct a decision tree and a payoff table. Advice the manufacturer on the best course of action.

9. Construct index numbers of price from the following data by applying :

- 1) Laspeyres Method
- 2) Paasche Method
- 3) Bowley's Method
- 4) Marshal Edgeworth Method

Also find Fischer's ideal index and test it for factor reversal and time reversal tests.

Commodity	$P_0$	$Q_0$	$P_1$	$Q_1$
A	12	18	14	16
B	15	20	16	15
C	14	24	15	20
D	13	29	12	23
E	11	28	13	21

#### SECTION – D

#### Case Study

This is a **compulsory** question.

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10. Four judges of a soft skills assessment test gave the following marks to six candidates. Using ANOVA test whether there is a significant difference in

- a) the performance of the six candidates
- b) the judgement of the four judges.

Judges	Candidates					
	A	B	C	D	E	F
1	11	12	11	12	13	13
2	13	13	11	13	12	12
3	3	12	12	14	13	12
4	14	15	13	16	14	12