

**P 6040**

M.B.A. DEGREE EXAMINATION, MAY/JUNE 2006.

First Semester

BA 100 — STATISTICS FOR MANAGEMENT

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

Use of calculator and statistical tables is permitted.

PART A — (10 × 2 = 20 marks)

1. Define population and sample. *unit 2*
2. What are the important characteristics of a good estimator? *unit 2*
3. Define the two types of errors in hypothesis testing. *unit 3*
4. Define level of significance. *unit 3*
5. Mention any two applications of F test. *unit 3*
6. Write a note on non-parametric tests. *unit 4*
7. Distinguish between correlation and regression. *unit 5*
8. What are the two regression lines? *unit 5*
9. What are the important components of a time series analysis? *unit 5*
10. Write a short notes on rank test. *unit 4*

PART B — (5 × 16 = 80 marks)

11. (i) The authorities in a certain city install 12,000 electric lamps in the streets of the city. If these lamps have an average life of 1000 burning hours with a standard deviation of 200 hours, assuming normality, what number of lamps might be expected to fail.  
  - (1) in the first 800 burning hours?
  - (2) between 800 and 1200 burning hours?

After what period of burning hours would you expect that 10% of the lamps would fail? (8)
- (ii) The mean weekly sales of soap bars in departmental stores was 145 bars per store. After an advertising campaign the mean weekly sales in 26 stores increased to 152 and showed a standard deviation of 17.5. Was the advertising campaign successful? Test at 5% level of significance. (8)

*unit 1*

12. (a) Write a note on normal distribution and explain the important characteristics of normal probability curve. (16)

Or

- (b) (i) The mean yield for acre plot is 662 kilos with a standard deviation 32 kilos. Assuming normal distribution, how many one acre plots in a batch of 1000 plots would you expect to have yield (1) over 700 kilos (2) below 650 kilos? (8)
- (ii) Samples of two types of electric light bulbs were tested for length of life and following data were obtained :

	Type I	Type II
Sample No	$n_1 = 8$	$n_2 = 7$
Sample means	$\bar{x}_1 = 1,234$ hrs	$\bar{x}_2 = 1,036$ hrs
Sample S.D's	$S_1 = 36$ hrs	$S_2 = 40$ hrs

Is the difference in the means sufficient to warrant that type I is superior to type II regarding length of life? (8)

13. (a) (i) Explain clearly the procedure generally followed in testing of a hypothesis. Point out the difference between one tail and two tail tests. (8)
- (ii) In a survey of buying habits, 400 women shoppers are chosen at random in super market 'A' located in a certain section of the city. Their average weekly food expenditure is Rs. 250 with a standard deviation of Rs. 40. For 400 women shoppers chosen at random in super market 'B' in another section of the city, the average weekly food expenditure is Rs. 220 with a standard deviation of Rs. 55. Test at 1% level of significance whether average weekly food expenditure of the two populations of shoppers are equal. (8)

Or

- (b) (i) Describe the applications of chi-square distribution and point out the conditions for the validity of chi-square test. (8)
- (ii) A die is thrown 60 times with the following results :

Face :	1	2	3	4	5	6
Frequency :	8	7	12	8	14	11

Test whether the die is unbiased at 5% level of significance. (8)

- unit-3*
14. (a) (i) Explain the test procedure of testing of independence of attributes. (8)
- unit-4*
- (ii) In a certain sample of 2000 families, 1400 families are consumers of tea. Out of 1800 vegetarian families, 1236 families consumes tea. Using chi-square test, state whether there is any significant difference between consumption of tea among vegetarian and non-vegetarian families. (8)

Or

- (b) (i) Explain the applications of F distribution. (8)
- (ii) Two independent samples of 8 and 7 items respectively had the following values of the variables.

Sample I    9    11    13    11    15    9    12    14

Sample II   10   12   10   14   9   8   10

Do the estimates of population variance differ significantly? (8)

- unit-3*
15. (a) (i) What are the advantages and drawbacks of non-parametric methods over parametric methods? (8)
- unit-4*
- (ii) The amount of money spent on research and development (R and D) by a large corporations is believed to have an effect of their gross sales. For the past 12 years, the following data have been recorded.

Year Number	Amount spent on R and D (in Rs. 100,000s)	Gross sales (in Rs. 10,00,000's)
1	1.9	2.8
2	3.4	3.2
3	6.5	3.0
4	5.7	4.0
5	2.8	4.6
6	2.3	3.8
7	6.2	3.4
8	7.6	3.2

Year Number	Amount spent on R and D (in Rs. 100,000s)	Gross sales (in Rs. 10,00,000's)
9	5.0	4.7
10	5.3	5.2
11	4.7	2.8
12	5.2	5.0

- (1) Obtain the correlation coefficient
- (2) Determine the coefficient of regression and coefficient of determination. (8)

Or

- (b) (i) Explain the important components in a time series analysis. (8)
- (ii) Calculate the trend values by the method of least squares from the data given below. (8)

*cmfj*

Year :	1994	1995	1996	1997	1998	1999	2000	2001	2002
Export (in crores) :	14	16	18	22	20	23	25	27	31

