

(6 pages)

MAY 2012

P/ID 77602/PBE1B

Time : Three hours

Maximum : 100 marks

PART A — (5 × 6 = 30 marks)

Answer any FIVE questions.

1. Discuss the difference between decision – making under certainty, uncertainty and risk.
2. Define Normal distribution and its applications.
3. Define X^2 distribution and mention the uses of X^2 test.
4. Define Simple Random Sampling and give two examples.
5. What is meant by a feasible solution of an LP problem?
6. Define slack and surplus variables in a linear programming problem.

7. Explain the following terms in PERT/CPM.
- (a) Earliest time
 - (b) Latest time
 - (c) Total activity time
 - (d) Event slack and
 - (e) Critical path.
8. Explain the brief idea about Academic and Business Research Reports.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

9. Find mean of the normal distribution.
10. The following is a pay off (in rupees) table for three strategies and two states of nature.

Strategy	N_1	N_2
S_1	40	60
S_2	10	-20
S_3	-40	150

Select a strategy using each of the following decision criteria.

- (a) Maximax
- (b) Minimax
- (c) Laplace
- (d) Regret.

assuming equiprobable states.

- 11. Explain different types of sampling and give examples.
- 12. A sample of 400 items is taken from a normal population whose mean is 4 and whose variance is also 4 . If the sample mean is 4.45, can the sample be regarded as truly random sample?
- 13. Solve the following LP problems using the simplex method.

$$\text{Max} = 5x_1 + 3x_2$$

Subject to

$$\begin{aligned}x_1 + x_2 &\leq 2 \\5x_1 + 2x_2 &\leq 10 \\3x_1 + 8x_2 &\leq 12 \\x_1, x_2 &\geq 0\end{aligned}$$

14. A marketing manager has five salesmen and five sales districts. Considering the capabilities of the salesmen and the nature of districts, the marketing manager estimates that sales per month (in hundred rupees) for each salesman in each district would be as follows :

		Districts				
		A	B	C	D	E
Salesmen	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment of salesmen to districts that will result in maximum sales.

15. The activities comprising a certain project have been identified as follows :

Activity	Preceding Activity	Duration (Weeks)	No.of men Required
A	–	4	1
B	–	7	1
C	–	8	2
D	A	5	3
E	C	4	1

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F	B, E	4	2
G	C	11	2
H	G, F	4	1

For the above project, draw the network. Determine critical path and its duration.

16. Explain brief idea about conducting investigation and Report Writing.

PART C — (1 × 20 = 20 marks)

(Compulsory)

17. A manufacturer wants to ship 22 loads of his product as show below. The matrix gives the kilometres from sources of supply to the destinations.

		Destination					Supply
		D_1	D_2	D_3	D_4	D_5	
Source	S_1	5	8	6	6	3	8
	S_2	4	7	7	6	5	5
	S_3	8	4	6	6	4	9
Demand		4	4	5	4	8	22
							25

Shipping cost is Rs. 10 per load per km. What shipping schedule should be used to minimize total transportation cost?

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