D 90136 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2015

EC/PTEC 09 502—QUANTITATIVE TECHNIQUES FOR MANAGERIAL DECISIONS

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. What are the different environments in which decisions are made ?
2. Explain the term 'carrying cost' in inventory management.
3. Define the terms basic solutions and basic feasible solutions.
4. What do you understand by a balanced and unbalanced transportation problem ?
5. What are the three time estimates and the expected time in PERT networks ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. What is meant by statistical decision analysis ? Describe some methods which are useful in decision-making under uncertainty ?
7. Discuss the similarities and differences of CPM and PERT.
8. What are the assumptions in EOQ formula ?
9. Explain the algorithm of Charnes M method of solving linear programming.
10. Explain stepping stone method in solving the context of Transportation problem.
11. Four different jobs can be done on four different machines. The set-up and take-down time costs are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees of producing job i on machine j.

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

How should the job be assigned to the various machines so that the total cost is minimized ?

(4 × 5 = 20 marks)

Turn over

Part C

Answer the following questions.

12. (a) The following matrix gives the pay-off of different strategies S_1, S_2, S_3 against different conditions N_1, N_2, N_3 and N_4. Indicate the decision taken under the following approach :

(i) Pessimistic. (ii) Optimistic.

(iii) Regret. (iv) Equal probability.

Or

(b) Explain multistage decision making with suitable example.

13. (a) Discuss in detail about Inventory control.

Or

(b) A particular item has a demand of 9,000 units/year. The cost of one procurement is Rs. 100 and the holding cost per unit is Rs. 2.40 per year. The replacement is instantaneous and no shortages are allowed.

Determine :

(i) The economic lot size.

(ii) The number of orders per year.

(iii) The time between orders.

(iv) The total cost per year if the cost of one unit is Re. 1.

14. (a) Solve by simplex method :

Maximize $Z = 3x_1 - x_2$

subject to $2x_1 + x_2 \leq 2$

$x_1 + 3x_2 \geq 3$

$x_2 \leq 4$

$x_1, x_2 \geq 0.$

Or

(b) Use the two-phase method to :

Minimize $Z = x_1 + x_2$

subject to $2x_1 + x_2 \geq 4$

$x_1 + 7x_2 \geq 7$

$x_1, x_2 \geq 0.$

15. (a) Solve the following assignment problem :

	I	II	III	IV	V
A	6	2	5	2	6
B	2	5	8	7	7
C	7	8	6	9	8
D	6	2	3	4	5
E	9	3	8	9	7
F	4	7	4	6	8

Or

(b) Solve the following transportation problem by finding an initial basic feasible solution and then by testing for optimality :

	D_1	D_2	D_3	D_4	Supply
S_1	11	20	7	8	50
S_2	21	16	10	12	40
S_3	8	12	18	9	70
Demand	30	25	35	40	

(4 × 10 = 40 marks)