

Roll No.

Total Pages : 4

BT-8/D-19

38031

OPERATION RESEARCH

Paper : EE-406E

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt five questions in all, selecting at least one question from each unit.

UNIT-I

- 1. (a) Explain characteristics and scope of Operation Research as modern management tool. 10
- (b) What is assumption/approximation needed in constructing an operational research model. 10
- 2. (a) A manufacturer produces two types of models M_1 and M_2 . Each M_1 model requires 4 hours of grinding and 2 hours of polishing; whereas each model M_2 requires 2 hours of grinding and 5 hours of polishing. The manufacturer has 2 grinders and 3 polishers. Each grinder works for 40 hours a week and each polisher works for 60 hours a week. Profit on M_1 model is Rs. 3 and on M_2 model is Rs. 4. How does the manufacturer allocate his production capacity to make maximum profit in a week ? Formulate the L.P.P. of it and is it possible to find the optimal point of L.P.P. formulate by using Graphical method, if yes then find it. 15
- (b) Describe post optimality analysis in Operation Research. 5

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UNIT-II

- 3. (a) Define and explain the following terms with reference to PERT :
 - (i) Total float.
 - (ii) Free float.
 - (iii) Independent float. 10
- (b) Describe Voyel's Approximation method in details. 10
- 4. ABC Limited has three production shops supplying a product to 5 warehouses. The cost of production varies from shop to shop, cost of transportation from shop to shop cost of transportation from shop to warehouses also varies. Each shop has a specific production capacity of each warehouse has certain amount of requirement. The cost of transportation are as given below :

Shop	Warehouse	Capacity	Cost of Production				
			III	IV	V		
	I	II					
A	6	4	4	7	5	100	14
B	5	6	7	4	8	125	16
C	3	4	6	3	4	17	15
Requirement	60	80	85	105	70		

Find the optimum quantity to be supplied from each shop to different warehouse at minimum cost. 20

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UNIT-III

5. (a) Discuss briefly the importance of operations research in decision-making. 10
- (b) Define Inventory. Discuss the role and importance of inventory models for management. 10
6. (a) Define the following terms with reference to PERT :
- (i) Total float.
- (ii) Free float.
- (iii) Independent float. 10
- (b) Define argument model and compare it with transport model. <http://www.kuonline.in> 10

UNIT-IV

7. (a) Define queuing theory and explain its limitations. 5
- (b) Arrival rate of telephone call at a telephone booth are according to Poisson distribution. With an average time of 9 minutes between two consecutive arrivals. The length of telephone call is assumed to be exponentially distributed with mean 3 minutes.
- (i) Determine the probability that a person arriving at the booth will have to wait.
- (ii) Find the average queue length.