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

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				
	I	II	III	IV	V		
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

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.