AS-820

M.B.A. (Semester—IV) Examination

APPLIED OPERATIONS RESEARCH

Paper–MBA/4402/OM

Time : Three Hours] [Maximum Marks : 70

Note :— (1) Attempt **ALL** the questions.

(2) Figures to the right indicate full marks.

(3) Scientific calculator is permitted.

SECTION–A

1. (A) What is Goal Programming ? State clearly its assumptions. Identify the major difference between programming and goal programming. 14

OR

(B) "Goal programming model seeks to minimize the deviations between the desired goals and the actual results to be obtained according to the assigned properties." Discuss. 14

SECTION–B

2. (A) Discuss clearly the different costs that are involved in the inventory management. 7

(B) The following informations are provided for an item :

Annual Demand : 12000 units

Ordering Cost : Rs. 60 per order

Carrying Cost : 10%

Unit Cost of Items : Rs. 10

Calculate Economic Order Quantity and Total Inventory Cost including Cost of Material. 7

OR

(C) What is Stock Out Cost ? How it is different from customer service cost ? 7

(D) A factory requires 1500 units of an item per month, each costing Rs. 27. The cost per order is Rs. 150 and the inventory carrying charges are 20% of the average inventory. Find EOQ. Would you accept a 2% discount on a minimum supply quantity of 1200 units ? 7

3. (A) What are different types of failures in replacement models ? Explain each in short. 7

(B) A firm is considering replacement of a machine, whose cost price is Rs. 12,200 and the scrap value is Rs. 200. The running (maintenance and operating) costs are found from experience to be as follows :

Year	1	2	3	4	5	6	7	8
Running Costs (Rs.)	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced ? 7

OR

(C) State some of the simple replacement policies and give the average cost functions for the same explaining your notations. 7

(D) A Company is considering the purchase of a new machine at Rs. 15,000. The economic life of the machine is expected to be 8 years. The salvage value of the machine at the end of the life will be Rs. 3,000. The annual running costs are estimated to be Rs. 7,000.

Assuming the interest rate of 5 per cent, determine the present worth of future costs of the proposed machine. 7

SECTION–C

4. (A) What is CPM ? What is PERT ? When will you recommend scheduling by PERT ? 7

(B) Discuss in brief total float, free float and independent float. 7

OR

(C) What do you know about network crashing ? Explain with example. 7

(D) Explain—three time estimates, expected time and activity variance in PERT. 7

SECTION–D

5. A road transport company has one reservation clerk on duty at a time. He handles information of bus schedule and makes reservations. Customer arrive at a rate of 8 per hour and the clerk can service 12 customers on an average per hour. After stating your assumptions, answer the following :

(1) What is the average number of customers waiting for the service of the clerk ? 4

(2) What is the average time a customer has to wait before getting service ? 4

(3) The management is contemplating to install a computer to handle the information and reservations. This is expected to reduce the service time from 5 to 3 minutes. The additional cost of having the new system works out to Rs. 50 per day. If the cost of goodwill of having to wait is estimated to be 12 paise per minute spent waiting before being served, should the company install the computer system ?

Assume 8 hour working day. 6