

Dr. Babasaheb Ambedkar Open University
Term End Examination January – 2026

Course : Diploma Course
Subject Code : DOR-01
Subject Name : Basics of Operation Research

Date : 28/02/2026
Time : 11:30am to 01:45pm
Duration : 02.15 Hours
Max. Marks : 70

- Q-1** Saroj Ltd. markets two feed mixes for cattle. The feed mix fertile, requires at least twice as much wheat as barley. The second mix multiplex requires at least twice as much barley as wheat. Wheat costs Rs. 1.70 per Kg and only 1,000 kg are available this month. Barley costs Rs. 1.27 per kg. and 1,300 kg is available Fertilex sells for Rs. 1.80 per Kg up to 99 kg and each additional kg over 99 sells for Rs 1.65 Multiplex sells at Rs. 1.70 per kg up to 130 kg and each additional kg over 99 sells for Rs. 1.55 per kg. Bharat farms will buy any and all amounts of both mixes that PQR Feed company will mix. Formulate this problem as a linear programming problem to determine the product mix that results in maximum profits. **14**

OR

Describe the structure of the linear programming model ?

- Q-2** Rashesh Ltd. manufactures two products A and B. Product A yields a contribution of Rs 35 per unit and product B Rs.50 per unit towards fixed costs. It is estimated that sales of product A for the coming month will not exceed 20 units. Sales of product B have not been estimated but the company does have a contract to supply at least 10 units to a regular customer. Machine hours available for the coming month are 130 and products A and B take 4 hours each respectively to produce Labour hours available are 180 and products A and B take 4 hours and 6 hours of labour, respectively Materials available are restricted to 40 units of two products while each uses one unit material per unit. The company wishes to maximize contribution. Using the graphic method find the optimum product mix. **14**

OR

Define Operation Research and state its relations with decision making?

- Q-3** Anita Ltd. produces three items A, B and C. The profit on these items are 2, 5 and 3 respectively. **14**

These items are prepared on three machines M1, M2 and M3. The details regarding uses and availabilities of these machines are given in the following table: Represent this as a linear programming problem:

Machine	Hours required/unit			Maximum available hours
	A	B	C	
1	1	1	1	80
2	8	5	4	500
3	3	3	7	210

OR

What are the opportunities and shortcomings of Operation Research?

- Q-4** In Parswanath Ltd. two machines A and B are used in manufacturing footballs and Volleyballs. The machine A is to be used for 5 minutes and the machine B is to be used for 3 minutes to manufacture a football while the machine A is to be used for 4 minutes and the machine B is to be used for 2 minutes to manufacture a volley ball. Each machine may be used for at the most 3 hours a day. Each football gives a profit of Rs. 4 and each volley ball gives a profit of Rs.5. How many footballs and volleyballs should be manufactured per day to earn maximum profit? **14**

OR

Rakesh Ltd. produces two types of products A and B. There are two sections in the factory. Each product of type A is to be processed for 4 hours in section 1 and 1 hour in section II. Each product of type B is to be processed for 1 hour in section I and 2 hours in section II. The section I may be used for maximum 104 hours per month and the section II may be used for maximum 75 hours per month. Each product of A gives a profit of rs.7 and each product of B gives a Profit of Rs. 11. Find how many units of each type should be produced to earn maximum profit.

- Q-5 Write a short notes (Any two)** **14**

1. Nature & Significance of Operation Research
2. Scope of Operation Research
3. Basic Operation Research Model
4. Advantages & Limitations of Linear Programming
5. Guidelines on Linear Programming Model Formulation
