

(6 pages)

S.No. 1309

12UBA07

(For the candidates admitted from 2012–2013 onwards)

B.B.A. DEGREE EXAMINATION, APRIL/MAY 2018.

Fourth Semester

INTRODUCTION TO OPERATIONS RESEARCH – II

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Distinguish game from sports.
2. Construct a coin-tossing game's matrix by stating the required assumptions.
3. What is meant by reneging in queuing?
4. How to denote a queuing model using Kendall's Notation?
5. What is meant by a 'Project'?
6. Why 'dummy' activities are needed?
7. What necessitate replacement in industrial engineering?

8. What is staff replacement problem?
9. Explain what "decoupling" means in the context of inventory management.
10. What is a reorder point?

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Solve the following game by maximin, minimax strategy : Player X is having strategies 1, 2, and 3 ; while Player Y is having strategies A, B and C.

	A	B	C
1	8.5	7.0	7.5
2	12.0	9.5	9.0
3	9.0	11.0	8.0

Or

- (b) Consider the following reward matrix for two players A & B. Which strategy should each of the two players choose?

	A1	A2	A3
B1	17	23	48
B2	17	3	51
B3	3	17	-2

12. (a) What are the various costs associated with queuing system?

Or

(b) Consider a disk drive that can complete an average request in 10 ms. The time to complete a request is exponentially distributed. Over a period of 30 minutes, 117,000 requests were made to the disk. How long did it take to complete the average request? What is the average number of queued requests?

13. (a) Explain the concept of dummy activity keeping networks for project management. Where to use and why?

Or

(b) Distinguish between PERT and CPM networks.

14. (a) The production department for a company requires 3600 kg of raw material for manufacturing an item per year. It has been estimated that the cost of placing an order is Rs.36 and the cost of carrying the same is 25% of the investments on the inventory. The price is Rs. 10 per kg. Assist the purchase manager to evolve a purchase policy.

Or

3

S.No. 1309

(b) An aircraft company uses rivets at an approximately constant rate of 5000 kg per year. The rivet cost Rs.20 per kg and the company personnel estimate that it costs Rs. 200 to place an order and the carrying cost of inventory is 10% per year. How frequently should orders for rivets be placed, and what quantities should be ordered for?

15. (a) What are the different types of failures? Enumerate with examples.

Or

(b) Age : 1 2 3 4 5
Operating cost (Rs.) 10,000 12,000 15,000 18,000 20,000

After five years, the operation cost is Rs. 6,000 K, where k = 6, 7, 8, 9, 10 (k denoting age in years). If the resale value decreases by 10% of purchase each year, what is the optimum replacement?

4

S.No. 1309

[P.T.O.]

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Use graphical method to solve the game.

Player A	Player B			
	B1	B2	B3	B4
A1	2	2	3	-2
A2	4	3	2	6

17. Write a short note on the essential features of a queuing system and its performance measures

18. A project schedule has the following characteristics :

Activity	1-2	1-3	2-4	3-4	3-5	4-9
Time (w)	4	1	1	1	6	5
Activity	5-6	5-7	6-8	7-8	8-10	9-10
Time (w)	4	8	1	2	5	7

Construct the network; compute E and L for each event and thus the critical path.

19. 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) cost [RC] are found from experience to be as follows :

Year	1	2	3	4	5	6	7	8
RC Rs.	200	500	8,000	1,200	1,800	2,500	3,200	4,000

When should the machine be replaced?

20. Write a detailed note on the Forms and Functions of inventory from the perspective of a manufacturing company.
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