



MBA DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2022)

Second Semester

MASTER OF BUSINESS ADMINISTRATION - PROJECT MANAGEMENT

P22MPB2112: Decision Models for Projects

COURSE OUTCOMES

- CO1:** Explain the concepts and characteristics of decision models in managing projects
- CO2:** Propose appropriate decision models in projects for arriving at an optimal solution using software
- CO3:** Establish suitable decision-making models in project management within the given conditions and constraints to arrive at rational decisions

Time: Three Hours

Maximum Marks: 100

PART A (10Q x 2 Mark = 20 Marks)

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|----|---|-----------------------|
| 1 | A manufacturer makes custom laptops and PC's. He has capital of ₹ 1 Cr to invest and plant capacity of 25 units. A laptop costs ₹60,000 to make and a PC costs ₹ 25000. He sells the laptop at a profit of ₹ 35000 and the PC at a profit of ₹2500. Assuming he can sell all the goods he manufactures. Formulate the scenario as a linear programming model. | CO3 [K ₃] |
| 2 | Outline the application of Simplex programming for managers. | CO1 [K ₂] |
| 3 | Evaluate the application of transportation modelling to global supply chain? | CO2 [K ₅] |
| 4 | Explain unbalanced transportation problem with an example. | CO1 [K ₅] |
| 5 | Describe the First-in-first-out (FIFO) queue discipline with an example. | CO1 [K ₅] |
| 6 | If 55 customers get a haircut at a saloon every day between 9 am to 7 pm. What is the efficiency of service offered if 5.5 customers arrive every hour. | CO3 [K ₄] |
| 7 | Distinguish between a zero-sum game and cooperative game. | CO1 [K ₁] |
| 8 | What is the significance of the saddle-point in a game. | CO2 [K ₃] |
| 9 | Distinguish between static and dynamic simulations. | CO1 [K ₂] |
| 10 | How can you apply simulations for solving problems in inventory management? | CO2 [K ₄] |

PART B (4Q x 16 Mark = 64 Marks) Answer Any Four Questions only

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| 11 | Chip Hoose is the owner of Hoose Custom Wheels. Chip has just received orders for 1,000 standard wheels and 1,250 deluxe wheels next month and for | CO3 [K ₆] |
|----|--|-----------------------|

800 standard and 1,500 deluxe the following month. All orders must be filled. Production Scheduling The cost of making standard wheels is \$10 and deluxe wheels is \$16. Overtime rates are 50% higher. There are 1,000 hours of regular time and 500 hours of overtime available each month. It takes .5 hour to make a standard wheel and .6 hour to make a deluxe wheel. The cost of storing a wheel from one month to the next is \$2. What will be the optimal policy?

- 12 Four orchards supply crates of oranges to four retailers. The daily demand amounts at the four retailers are 150, 150, 400, and 100 crates, respectively. Supplies at the four orchards are dictated by available regular labor and are estimated at 150, 200, and 250 crates daily. However, both orchards 1 and 2 have indicated that they could supply more crates, if necessary, by using overtime labor. Orchard 3 does not offer this option. The transportation costs per crate from the orchards to the retailers are given in the Table below. (a) Formulate the problem as a transportation model. (b) Solve the problem. (c) How many crates should orchards 1 and 2 supply using overtime labor?

CO2 [K₅]

Profits made the retailers					Supply
	Client 1	Client 2	Client 3	Client 4	
Retailer 1	\$ 7.00	\$ 7.00	\$ 9.00	\$ 9.00	150
Retailer 2	\$ 7.00	\$ 9.00	\$ 8.00	\$ 8.00	150
Retailer 3	\$ 6.00	\$ 8.00	\$ 9.00	\$ 6.00	400
Retailer 4	\$ 6.00	\$ 9.00	\$ 9.00	\$ 8.00	100
Demand	200	300	200	100	

- 13 Approximately 180 customers per day visit a food court for lunch (Assume it's open from 10 am to 10 pm). The cost per customer served is Rs. 50 to maintain an average service time of 2 minutes. However, for each second decrease in the average waiting time, the cost increases by Rs. 5 per second. How much would the food court need to budget to decrease the average waiting time to less than 2 minutes?

CO2 [K₅]

- 14 Two opposing armies, Red and Blue must each decide whether to attack or defend. These decisions are made without knowledge of the opposing army's decision. The payoff table in terms of value of property gained or lost for the red army, appears below. Any gains for the red army are losses for the blue army.

CO3 [K₃]

		Blue Army	
		Attack	Defend
Red Army	Attack	30	50
	Defend	40	0

- What is the optimal mixed strategy for the Red Army?
- What is the optimal mixed strategy for the Blue Army?

15 Elaborate on the steps to conduct a simulation process.

CO1 [K₂]

Part – C (1Q x 16 Mark = 16 marks)

16

CO3 [K₅]

Two companies compete for a share of the soft drink market. Each has worked with an advertising agency to develop alternative strategies for the coming year. A variety of television advertisements, newspaper advertisements, product promotions and in-store displays have provided four different strategies for each company. The pay-off table summarizes the gain in the market share for company A projected for the various combinations of company A and company B strategies. What is the optimal strategy for each company? What is the value of the game?

		Company B		
		B1	B2	B3
Company A	A1	3	0	2
	A2	2	-2	1
	A3	4	2	5
	A4	-2	6	-1
