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Total No. of Pages : 03

Total No. of Questions : 15

MBA (2012 & onward) (Sem.-3)

APPLIED OPERATIONS RESEARCH

Subject Code : MBA-301

Paper ID : [C1169]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** contains **SIX** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
2. **SECTIONS-B** consists of **FOUR** Subsections : Units-I, II, III & IV. Each Subsection contains **TWO** questions each carrying **EIGHT** marks each and student has to attempt any **ONE** question from each Subsection.
3. **SECTION-C** is **COMPULSORY** and consist of **ONE** Case Study carrying **EIGHT** marks.

SECTION-A

1. Define OR and bring out its scope.
2. What are the assumptions of queuing model?
3. What do you mean by replacement?
4. Explain the difference between assignment and transportation
5. What do you mean by crashing? Write its advantages.
6. Explain the conditions of odd and dominance method of game theory.

SECTION-B

UNIT - I

7. What do you understand By Decision Tree Analysis? How is a Decision Tree Drawn and how is such analysis useful in decision making? Explain taking with example.
8. The Following table gives the activities and other relevant data of a project.

Activities	Time (Days) Normal	Time(Days) Crash	Cost Normal	Cost Crash
1-2	4	3	1200	180
1-4	6	4	300	500
1-3	2	1	60	120
2-4	5	3	300	500
3-4	2	2	200	200
2-5	7	5	230	350
4-5	4	2	200	480

Indirect Cost per day for the project is Rs. 100.

- Draw the network Diagram.
- Find the normal duration and cost of the project.
- Crash the number of days to the maximum possible.
- Find the optimum duration and cost.

UNIT - II

- Define (a) slack, surplus, artificial Variables (b) Equality and inequality (c) Decision Variables and basic variables. Explain with examples.

OR

- Solve the transportation problem to maximize profits & give criterion for optimality.

	1	2	3	4	Capacity
A	40	25	22	33	100
B	44	35	30	30	30
C	38	38	28	30	70
Requirement	40	20	60	30	150/200

UNIT - III

- Solve Graphically

		Player B			
		1	2	3	4
Player A	1	8	5	-7	9
	2	-6	6	4	-2

OR

- What is Sequencing Problem? Give its features. How it is differ from assignment problem ?

UNIT - IV

13. Give the role of Queuing theory in decision-making and discuss its application.

OR

14. Following Mortality rates have been observed for a certain types of fuses :

Week	1	2	3	4	5
% Failing by the end of the week	5	15	35	75	100

There are 1000 Fuses in use and it cost Rs. 5 to replace on individual Fuse. If all the fuses were replaced simultaneously it would cost Rs. 1.25 per fuse. At what intervals the group replacement should be done? Which policy is better?

SECTION -C

Case Study

15. Three plants A,B, C make two products X and Y and the production schedule for the next 2 months is to be finalized. X require 5 machine hours per unit and Y requires 7 machine hours.

The Supply commitments and the plant capacities are given below:

Product	Supply to be made Month 1	Supply to be made Month 2
X	200	250
Y	450	500

Plant		Machine hours available Month 1	Machine hours available Month 2	Cost of production Rs. per unit (X)	Cost of production Rs. per unit (Y)
A	Regular	1000	1000	20	30
A	Overtime	500	500	25	38
B	Regular	1000	800	22	33
B	Overtime	500	400	28	42
C	Regular	3000	1500	30	35

The machine Hours Available during different months varies according to maintenance requirement and expected machine downtime.

If the product is manufactured in excess of its requirement during the month, storage costs are incurred at the rate of Rs. 2 per unit per month.

Determine the Optimal Production Schedule. What will be total cost?