

Dr. Babasaheb Ambedkar Open University
Term End Examination July- 2014

Course : Diploma in Operation Research (DOR)

Numerical Code: 0030

Roll No.: _____

Subject : Basics of Operation Research (DOR-01)

Numerical Code: 0188

Date : 23/07/2014

Time : 11.00 to 02.00

N.B. : All questions carry equal Marks.

Total Marks : 70

Q.1 Define Operation Research and explain the opportunities and shortcoming of operation research approach. (14)

OR

Describe relation between operation research and decision making.

Q.2 State the uses of operation research in various areas. (14)

OR

State the guidelines in linear programming model formulation.

Q.3 Explain the advantages and limitations of liner programming. (14)

OR

Describe various operation research models.

Q.4 Explain the application areas of linear programming. (14)

OR

Use the graphical method to solve the following LP problem in following equation for Ram Ltd.

Maximumize $Z=15x_1 + 10x_2$

Subject to the constraints

$$4x_1 + 6x_2 \leq 360$$

$$3x_1 + 0x_2 \leq 180$$

$$0x_1 + 5x_2 \leq 200$$

And $x_1, x_2 \geq 0$

Q.5 Explain the history nature and signification of operations research. (14)

OR

A diet for a sick person must contain atleast 4100 units of vitamins, 50 units of minerals and 1300 calories. Two foods A and B are available in market at a cost of Rs. 50 and 35 respectively. One unit of A contains 250 units of vitamins, 2 units of mineral and 50 calories and one unit of B contains 100 units of vitamins, 2 units of mineral and 40 calories.

Solve the above problem graphically.

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Course : Diploma in Operation Research (DOR)

Numerical Code: 0030

Roll No.: _____

Subject : Assignment and Transportation Problems. (DOR-02)

Numerical Code: 0189

Date : 23/07/2014

Time : 03.00 to 06.00

N.B. : All questions carry equal Marks.

Total Marks : 70

Q.1 Explain the mathematical statement of problem. (14)

OR

Explain the solution method of Assignment problem.

Q.2 Solve the following problem so as to maximize the profit for love Ltd. (14)

(Profit in ₹) Job

		A	B	C	D
Worker	P	11	12	13	14
	Q	14	15	16	17
	R	15	16	17	18
	S	18	17	16	15

OR

Solve the following assignment problem to minimize the total expense for Ravi ltd.

Destinations

Origins	D1	D2	D3	D4	D5
Q1	3	5	4	6	5
Q2	8	5	7	9	5
Q3	3	10	9	11	5
Q4	9	7	13	8	5
Q5	3	9	6	9	9

Q.3 A Machine expenses ₹ 10,000. Annual Operating expenses is ₹ 400 for the first year and then Increase by ₹ 800 every year. After how many years should the machine be replaced? (14)

OR

A Machine expenses ₹ 12,200 and its CQ scrap value is ₹ 200, a constant in pavan ltd. Its maintain expenses is known from the plest experience as follwos. After how many years should machine replaced?

Year	1	2	3	4	5	6	7	8
Maintainance expense in ₹	200	500	800	1200	1800	2500	3200	4000

Q.4 Solve the following problem by North-West corner rule for XY Ltd. (14)

Plant	1	2	3	4	Supply
A	5	4	9	2	32
	7	6	10	7	28
Requirement	18	16	14	12	60

OR

Solve the following problem by Vogel's method for nirav Ltd.

From	TO			Supply
	A	B	C	
1	18	22	10	20
2	25	11	20	22
3	15	30	7	18
Requirement	16	21	23	60

Q.5 Write a short-note on any two of the following.

(14)

1. Maximization case in Assignment problem
 2. Restrictions on Assignment
 3. Transportation Algorithm (Modi method)
 4. Vogel's Approximation method
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Course : Diploma in Operation Research (DOR)

Numerical Code: 0030

Roll No.: _____

Subject : PERT & CPM (DOR-03)

Numerical Code: 0190

Date : 24/07/2014

Time : 11.00 to 02.00

N.B. : All questions carry equal Marks.

Total Marks : 70

Q.1 Explain Events and Activities. (14)

OR

Explain significance of using PERT and CPM.

Q.2 What is PERT and CPM? Give the basic difference between PERT and CPM. (14)

OR

Explain critical path Analysis.

Q.3 Explain the different phases of project Management. (14)

OR

Describe PERT/CPM Network components and precedence relationship.

Q.4 Write Short note on any two (14)

1. Backward pass method
2. Cooping and Dummies in network
3. Project crashing
4. Forward pass method

Q.5 Draw network Diagrams from the following list of activities for Aanal ltd. (14)

Activity	Immediate Predecessor Activities		
	Set-1	Set-2	Set-3
A	-	-	-
B	-	-	-
C	-	-	-
D	A	A	A
E	B	A, B	A, B
F	B, C	A, B, C	B, C
G	D, E, F	D, E, F	C
H	E, F	F	D, E, F

OR

A Small project of Shyam Ltd. Consists of Seven activities the details of which are given below.

Activity	Daration (days)		Perssimistic	Immediate predecessor
	Most likely	Optimistic		
A	3	1	1	-
B	6	2	14	A
C	3	3	3	A
D	10	4	22	B, C
E	7	3	15	B
F	5	2	14	D, E
G	4	4	4	D

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Numerical Code: 0030

Roll No.: _____

Subject : PERT & CPM (DOR-04)

Numerical Code: 0191

Date : 24/07/2014

Time : 03.00 to 06.00

N.B. : All questions carry equal Marks.

Total Marks : 70

Q.1 Explain various types of Decision making environment and discuss steps in decision theory approach. (14)

OR

Write a note on expected value of perfect information.

Q.2 Discuss decision making under uncertainty. (14)

OR

Explain Techniques to deal with risk.

Q.3 Write Short note on the following (Any two) (14)

1. EMV and EOL criteria
2. Decision tree Analysis
3. Decision making Environment
4. Degree of certainty

Q.4 Mr. tarence quite often files from Ahmedabad to Mumbai. He can use the airport bus which expenses ₹ 25 but if he takes it, there is a 0.08 chance that he will miss the flight. The stay in a hotel expenses ₹ 270 with a 0.96 chance of being on time for the fight for ₹ 350 he can use a taxi, which will make 99 of chance of being on time for the flight of he catches the plan on time, he will conclude "businesss transalation which will produce a profit of ₹ 10,000, otherwise he will lose it which mode of transport should he use? Answer on the basis of EMV Griterion. (14)

OR

Write a note on Simulation.

Q.5 Particulars of a project is as under. (14)

Investment in fixed assets : ₹ 48,00,000

Investment in current assets : ₹ 22,00,000

Useful life : 5 years

Scrap Value : ₹ 3,00,000

Estimated in come before depreciation and tax and probability ia as follows.

Year	Income (₹)	Probability
1	6,00,000	0.1
2	11,00,000	0.2
3	21,00,000	0.5
4	31,00,000	0.1
5	40,00,000	0.1

Tax rate is 50%.

Would you recommend the proposal if present value of ₹ 1 for 10 years at 12% rate of discount would be ₹ 5.6 % and its present value at the end of 10th years would be 0.322

OR

Write a note on "Sensitivity Analysis".