Dr. Babasaheb aAmbedkar Open University
Term End Examination April - 2011

Course : Diploma in Operation Research **(DOR)**

Roll No.: _____

Subject : Basic of Operation Research **(DOR-01)**

Date : **20/04/2011**

Time : **11.00 to 02.00**

N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 Define Operation Research and state its relation with decision making. (14)

OR

What are the opportunities and short comings of Operation Research ?

Q.2 State the uses of Operation Research in various areas. (14)

OR

Describe various Operation Research models.

Q.3 State the application areas of Linear Programming Models. (14)

OR

State the guidelines in Linear Programming Model formulation.

Q.4 Describe the structure of the Linear Programming Model. (14)

OR

Find the values of x_1, x_2, such that $Z=3x_1+4x_2$ is maximum subject to the following constraints for Tulshi Ltd.

$2x_1+5x_2 \leq 120$

$4x_1+2x_2 \leq 80$

$x_1, x_2 \geq 0$

Q.5 Use the Graphical Method to solve the following LP problem for Saraswati Ltd. (14)

Minimize $Z = -x_1 + 2x_2$

Subject to the constraints

$-x_1 + 3x_2 \leq 10$

$x_1 + x_2 \leq 6$

$x_1 - x_2 \leq 2$

$x_1 , x_2 \geq 0$

OR

Use Graphical Method to solve the following LP problem for Raman Ltd.

$\therefore$ Maximize $Z = 3x_1 + 2x_2$

Subject to the constraints $x - x_2 \geq 1$, $x_1 + x_2 > 3$ and $x_1, x_2 \geq 0$

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Course : Diploma in Operation Research **(DOR)**

Roll No.: _____

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

Date : **20/04/2011**

Time : **03.00 to 06.00**

N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 Describe the steps to the method of solution for Assignment problem. (14)

OR

Explain mathematical model of Transportation problem.

Q.2 Explain Assignment problem. (14)

OR

Explain Traveling Salesman problem.

Q.3 Solve the following assignment problem to minimize the total expense for Madhuvan Ltd. (14)

Destinations

Origins	D_1	D_2	D_3	D_4	D_5
O_1	3	5	4	6	5
O_2	8	5	7	9	5
O_3	3	10	9	11	5
O_4	9	7	13	8	5
O_5	3	9	6	9	9

OR

Solve the following problem so as to maximize the profit for Khushi Ltd.

(Profit in Rs.) Jobs

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

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

To

From	I	II	III	Supply
1	7	12	9	16
2	8	10	6	10
3	10	9	12	12
Demand	8	11	19	38

OR

Solve the following problem by Vogel's Method for Mahalaxmi Ltd.

To

From	A	B	C	Supply
I	18	22	10	20
II	25	11	20	22
III	15	30	07	18
Requirement	16	21	23	60

Q.5 Write Note on the following (Any two) (14)

1. Vogel's Approximation Method.
2. Transportation Algorithm (Modi Method).
3. Restrictions on Assignments.
4. Maximization case in Assignment problem.

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Course : Diploma in Operation Research **(DOR)**

Roll No.: _____

Subject : PERT & CPM **(DOR-03)**
Date : **23/04/2011**
Time : **11.00 to 02.00**
N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 Explain Events and Activities. (14)

OR

Describe PERT/CPM network components and precedence relationships.

Q.2 Explain Significance of using PERT and CPM. (14)

OR

What is PERT and CPM ? Give the basic difference between PERT and CPM.

Q.3 Explain Critical Path Analysis. (14)

OR

Explain the different phases of Project Management.

Q.4 Write any two Short note. (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 B Ltd. (14)

Activity	Predecessor activity		
	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 project of A Ltd. has the following activities and other characteristics.

Activity	Preceding activity	Time Estimates (weeks)		
		Optimistic	Most Likely	Pessimistic
A	-	4	1	16
B	-	1	5	15
C	A	6	12	30
D	A	2	5	8
E	C	5	11	17
F	D	3	6	15
G	B	3	9	27
H	E, F	1	4	7
I	G	4	19	28

Draw the PERT network diagram and Identify the Critical path.

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Roll No.: _____

Subject : PERT & CPM **(DOR-04)**
Date : **23/04/2011**
Time : **03.00 to 06.00**
N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 State the types of environment under which decisions can be made. (14)

OR

Write short note on maximax criteria of decision making.

Q.2 Write short note on the following (Any two) (14)

1. Expected Opportunity Loss.
2. Concept of decision making.
3. Expected Value of Perfect Information.
4. Decision Tree Approach.

Q.3 Explain Sensitivity Analysis as a risk reducing measures in Capital Budgeting. (14)

OR

Explain simulation as a risk reducing measure in capital budgeting.

Q.4 What a maximum amount can be paid for obtaining perfect information for forthcoming activities. (14)

OR

What are the reasons for which risk reducing measures to be used in capital budgeting.

Q.5 Two mutually exclusive projects are under consideration by Heena Ltd. (14)
The initial investment in both of them is Rs. 1,00,000. The economics life of both is estimated at 5 years and they have no scarp value. Their estimated cash flows and certainty equivalent are as under:

Years	Project A cash flow Rs.	Project B certainty Equivalent	Cash flow	Certainty Equivalent
1	70,000	0.8	85,000	0.5
2	65,000	0.6	1,25,000	0.4
3	55,000	0.5	50,000	0.3
4	35,000	0.4	30,000	0.2
5	30,000	0.3	20,000	0.1

If the cost of capital of both is 15%, Calculate the Net Present Value of both and state which project is acceptable.

OR

The Probability distribution of monthly sales of an item of Ravi Ltd. is as follows:

Monthly Sales (units)	0	1	2	3	4	5	6
Probabilities	0.01	0.06	0.25	0.30	0.22	0.10	0.06

The expense of carrying inventory (unsold during the month) is Rs. 30 per unit per month and expense of unit shortage is Rs. 70. Determine Optimum stock to minimize expected expense.