Dr. Babasaheb Ambedkar Open University
Term End Examination June/July - 2013

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

Roll No.: _____

Subject : Basics of Operation Research **(DOR-01)**
Date : **27/06/2013**
Time : **11.00 to 02.00**
N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 What is Operation Research? State its relations with decision making. **(14)**

OR

Describe various Operation Research Models.

Q.2 Describe the structure of the Linear Programming Model. **(14)**

OR

State the application areas of linear progarmming models.

Q.3 Solve the following L.P. problem for Dev Ltd. **(14)**

Find X_1, X_2 such that

$5X_1 + 10X_2 \leq 50$

$X_1 + X_2 \geq 1$

$X_2 \leq 4$, $X_1, X_2 \geq 0$

OR

Discuss the Nature and Signifiacance of operations Research with steps.

Q.4 Explain the General Mathematical Model of Linear Programming Problem. **(14)**

OR

Explain special special cases in Linear Programming.

Q.5 Awatch-dealer wishes to buy new watches and has two models M_1 and M_2 Model M_1 costs Rs. 250 and M_2 costs Rs. 390 . His show case has space for 30 watches and he has Rs. 7,500 to spend. The watch dealer may make a profit of Rs. 20 in model M_1 and Rs. 50 in model M_2.

How many watches of each model should he buy to Obtain maximum Profit. **(14)**

OR

Explain:

1. Assumptions of Linear Programming .
2. Opportunities and ShortComings of Operations Research Approach.

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

Roll No.: _____

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

Date : **27/06/2013**

Time : **03.00 to 06.00**

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

Q.1 Explain Assignment Problem. **(14)**

OR

Explain Traveling Salesman problem.

Q.2 Obtain a feasible solution of the following transportation problem by North-West corner rule for Shyam Ltd. **(14)**

Origins		**A**	**B**	**C**	**D**	**Supply**
	x	1	5	2	6	13
	y	9	10	3	8	17
	z	5	4	7	3	5
Requiremeut		5	11	15	4	35

The expense matrix shows the transportaticn expense in Rs. Per unit.

OR

Explain the Mathematical statement of the problem.

Q.3 The Purchase price of amachine is Rs. 9000. its maintanance expense for the first year is Rs. 200 and then it increases by Rs. 1500 every year. Determine at which time it is Profitable to replace the machine.

(14)

OR

A Machine expenses Rs. 10,000 Annual Operating expenses is Rs. 400 for the first year and then increases by Rs. 800 every year. After how many years shoul the machine be replaced?

Q.4 Solve the problem to minimize the total distance travaled. **(14)**

	P	**Q**	**R**	**S**	**T**	**U**
A	41	62	39	52	25	51
B	22	29	49	65	81	50
C	27	29	60	51	32	32
D	45	50	48	52	37	43
E	29	40	39	26	30	33
F	82	40	40	60	51	30

OR

Solve the following assisnment Problem to maximize the total Profit for sun ltd

(Profit in Rs.)

	O_1	**O_2**	**O_3**	**O_4**
Q_1	3	4	11	9
Q_2	5	7	8	9
Q_3	5	6	6	7
Q_4	4	6	8	8

Q.5 Write a short-note on any two of the following. **(14)**

(a) Least cost method.

(b) Problem of replacement.

(c) Matrix minima Method.

(d) North-west corner Method.

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

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Subject : PERT & CPM **(DOR-03)**
Date : **29/06/2013**
Time : **11.00 to 02.00**
N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 What is PERT and CPM? State Significance of using PERT & CPM **(14)**

OR

Discuss phases of Project Management.

Q.2 Discuss Major Components of PERT/CPM. **(14)**

OR

Write a note on Critical Path Analysis.

Q.3 Explain Project Scheduling and Projeact Crashing **(14)**

OR

Write a note on Resource Allocation.

Q.4 **Write Short note on any two:**(1) Difference Between PERT and CPM. **(14)**
(2) Float of an Activity and Event.
(3) Resource Smoothing.
(4) Backward Pass Method.

Q.5 From the following data determine. **(14)**
i. Expected task time and their Variances.
ii. The Critical Path.

Task	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Optimistic Time	10	36	52	32	30	12	14	14	6
Pessimistic Time	20	44	80	40	50	24	24	18	10
Most Likely Time	16	40	66	36	40	18	20	16	8

OR

From the following table darw the network diagrams.

Activity	**Normal time (days)**
1-2	6
2-3	6
2-4	14
2-5	18
3-5	10
4-5	0
5-6	12
6-7	8
6-8	26
7-8	20

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

Roll No.: _____

Subject : PERT & CPM **(DOR-04)**
Date : **29/06/2013**
Time : **03.00 to 06.00**
N.B. : All questions carry equal Marks. **Total Marks : 70**

Q.1 Discuss decision making under uncertainty. **(14)**

OR

Write a not on simulation.

Q.2 **Explain:** (i) Steps in Decision Theory Approach. **(14)**
(ii) Types of Decision making Environment.

OR

Explain sensitivity Analysis as a risk reducing Measure in capital Budgeting.

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

1. Perfect information and imperfect information.
2. Degree of Certainity.
3. Decisiaon tree Analysis
4. EMV and EOL criteria.

Q.4 The Probability distribution of monthly sales of in Mansi ltd. is as follows. **(14)**

Monthly sales (Rs. '00000)	0	1	2	3	4	5	6
Probability	0.01	0.04	0.05	0.32	0.45	0.60	0.08

The expense of carrying inventory (unsold during the month) is Rs. 600 per unit per month and expense of unit storage is Rs. 800. Determine Optimum stock to minimize expected expense.

OR

Explain the techniques to deal with the risk.

Q.5 The total investment in a project of Rima ltd. is estimated as Rs. 2,20,000. Its forecast cash and certainly equivalent are as follows: **(14)**

Year	Cash flow	Co-efficient
1	1,10,000	0.90
2	80,000	0.70
3	80,000	0.50
4	1,20,000	0.30

The risk free discount rate is 10%. Determine NPV. The present value of Rs. 1 at 10% are 0.909, 0.826, 0.751 and 0.683 respectively for all the years.

OR

Explain the concept of Decision Making.
