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

Roll No.: _____

Subject : Basics of Operation Research (**DOR-01**)
Date : **29/01/2014**
Time : **11.00 to 02.00**
N.B. : All questions carry equal Marks.   **Total Marks : 70**

Q.1 Define Operation Research and its uses in various areas. **(14)**

OR

Explain the nature and Significance of Operations Research with steps.

Q.2 State the guidelines in Linear Programming model formulation. **(14)**

OR

Explain the graphical solution of linear programming problems.

Q.3 Find the values of X_1, X_2 such that $Z=3x_1 + 4x_2$ is maximum subject to the following constraints. **(14)**

$$2x_1 + 5x_2 \leq 120$$
$$4x_1 + 2x_2 \leq 80$$
$$x_1, x_2 \geq 0$$

OR

Explain relation between Operations Research and decision Making.

Q.4 Discuss about application Areas of Linear Programming. **(14)**

OR

Explain the special cases in Linear Programming.

Q.5 Anisha Ltd. Produces two types of machines for producing machine of type A, 2 tons of iron and 250 working hours are required and for producing machine of type B, 4 tons of iron and 160 working hours are required. The manufacturer has 950 tons of iron and 65,000 working hours at his disposal. **(14)**

If the profit on type A machine is rupees 550 and that on type B machine is rupees 800.

Find how many machines of type A and type B should be produced to get maximum profit.

OR

Explain:
1. Procedure of Operations research.
2. Importance of linear programming.

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Term End Examination January- 2014

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

Roll No.: _____

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

Date : **29/01/2014**

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		P	Q	R	S	Supply
	A	1	5	2	6	13
	B	9	10	3	8	17
	C	5	4	7	3	5
Requiremeut		5	11	15	4	35

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

OR

Solve the following assignment problem to minimize the total expense for Ram 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 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 assinsnment Problem to maximize the total Profit for sun ltd

(Profit in Rs.)

	D1	D2	D3	D4
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.4 Obtain a feasible solution of the following problem by Matrix minima Method for Sun Ltd. **(14)**

Form	P	Q	R	Supply
1	5	6	7	6
2	12	8	4	10
3	3	10	14	3
Requiremeut	10	4	5	19

OR

The Price of a machine is Rs. 9,000. Its maintain expense is Rs. 200 for the first year and then it increase by Rs. 2,000 per year At What time is it possible to replace the Machine.

Q.5 **Write a short-note on any two of the following.** **(14)**
  (a)   Matrix minima Method
  (b)   Least cost Method
  (c)   Problem of replcement
  (d)   Restriction of Assignment

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

Roll No.: _____

Subject : PERT & CPM (**DOR-03**)
Date : **30/01/2014**
Time : **11.00 to 02.00**
N.B. : All questions carry equal Marks.   **Total Marks : 70**

Q.1 Explain the meaning of PERT and CPM and distinguish between two. **(14)**

OR

Discuss Errors and Dummies in network.

Q.2 Explain Backward pass method. **(14)**

OR

Write a note on Critical Path Analysis.

Q.3 Discuss float of an Activity and Event. **(14)**

OR

Discuss different phases of Project Management.

Q.4 **Write Short note on any two:** (1) Resource Smoothing. **(14)**
(2) Backward pass Method.
(3) Project Scheduling with uncertainty.
(4) Significance of PERT and CPM.

Q.5 Prepare Network Diagram. **(14)**

Activity	Immediate Predecessor Activities
A	-
B	A
C	B
D	C
E	A
F	E
G	E
H	HI

OR

Draw network diagrams.

Activity	Predecessor Activity		
	Set1	Set2	Set3
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

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

Roll No.: _____

Subject : PERT & CPM (**DOR-04**)
Date : **30/01/2014**
Time : **03.00 to 06.00**
N.B. : All questions carry equal Marks.   **Total Marks : 70**

Q.1 Discuss decision Tree Analysis. **(14)**

OR

Explain Techniques to deal with risk.

Q.2 Write a note on Maximax criteria of Decision Making. **(14)**

OR

Describe decision Making under uncertainty.

Q.3 **Write Short note on the following (Any two)** **(14)**
1. Simulation.
2. Sensitivity Analysis.
3. Coefficient of Variatoion.
4. Optimistic-Pessimistic Estimats.

Q.4 Vandana, a Producer of machines has estimated the following distribution of demand for a particular kind of Machine. **(14)**

Demand (No. of Machinwes)	0	1	2	3	4	5	6
Probability	0.14	0.27	0.27	0.18	0.09	0.04	0.01

Cost of each machine is Rs. 7,000 and he sells at Rs. 10,000 each. How many machines should be sold to earn maximum profit.

OR

Write a note on Degree of Certainty.

Q.5 From the following information of machine 'A' and machine 'B' give your opinion that which machine should be purchased. **(14)**

	Machine A	Machine B
Cost (Rs.)	55,000	55,000
Extimated Life	4 Years	4 Years
Scrap Value (Rs.)	10,000	10,000
Risk Adjusted rate of Discount	16%	16%
Risk less discount Rate	10%	10%

Cash flow and Certainty – equivalent Co-efficient is as under.

Year	Machine-A		Machine-B	
	Cash Flow	C.E.	Cash Flow	C.E.
1	30,000	0.8	18,000	0.9
2	30,000	0.7	36,000	0.8
3	30,000	0.6	24,000	0.7
4	30,000	0.5	32,000	0.4

OR

Write a note on Expected Value of Perfect Information.