Dr. Babasaheb Ambedkar Open University
Term End Examination January-2016

Course	: Diploma in Operation Research (DOR)	**Numerical Code: 0030**
Subject	**:** Basics of Operation Research (DOR-01**)**	**Numerical Code: 0188**
Date	: **28/01/2016**	**Roll No._____**
Time	: **11.00 to 02.00**	
N.B.	: All questions carry equal Marks.	**Total Marks : 70**

Q.1 What is operation Research? What is use of Operation Research in Decision Making? Discuss Phases in OR procedure. **(14)**

OR

Explain Basic Operations Research models.

Q.2 What is linear programming? Discuss application areas of Linear Programming. **(14)**

OR

Discuss advantages and limitations of Linear Programming models.

Q.3 Solve the following L.P Problem for a company. Find x_1 and x_2 Such that **(14)**

$15x_1 + 30x_2 \leq 150$

$x_1 + x_2 \geq 2$

$x_2 \leq 4$, x_1 and $x_2 \geq 0$

And $2 = x_1 + x_2$ is Maximum

OR

Write a short note on: The graphical Solution of Linear Programming problems.

Q.4 **Write short note on Any Two:** **(14)**

1. Nature and significance of operations Research
2. Opportunities and Short comings of operations Research approach
3. Structure of Linear Programming model

Q.5 Explain Scope of Operations Research. **(14)**

OR

Use graphical Method to solve the following LP problem for a company.
Maximize $Z = 3x_1 + 2x_2$
Subject to the Constraints
$x_1, x_2 \geq 1$
$x_1 + x_2 > 3$
And $x_1, x_2 \geq 0$

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Course	: Diploma in Operation Research **(DOR)**		**Numerical Code: 0030**
Subject	: Assignment and Transportation Problems. **(DOR-02)**		**Numerical Code: 0189**
Date	: **28/01/2016**		**Roll No._____**
Time	: **03.00 to 06.00**		
N.B.	: All questions carry equal Marks.		**Total Marks₹ 70**

Q.1 What is Assignment problem? Explain Mathematical Statement of Assignment problem. **(14)**

OR

Explain Variations of the Assignment problem.

Q.2 Explain Mathematical model of Transportation problem. **(14)**

OR

Explain Solution Method of Assignment problem.

Q.3 Obtain a basic feasible solution of the following transportation problem by XYZ Ltd. **(14)**

Origins	D_1	D_2	D_3	D_4	D_5	Supply
Q_1	3	4	6	8	9	20
Q_2	2	0	1	5	8	30
Q_3	7	11	20	40	3	15
Q_4	2	1	9	14	16	13
Demand	40	6	8	18	6	78

OR

The expense price of a Machine is ₹5000. Its Maintenance expense and the Scrap value at the end of each year is given as follows. When should the Machine be replaced?

Year	1	2	3	4	5	6	7	8
Maintenance Expense (₹)	1,500	1,600	1,800	2,100	2,500	2,900	3,400	4,000
Scrap value (₹)	3,500	2,500	1,700	1,200	800	500	500	500

Q.4 Explain North-West Corner Method. **(14)**

OR

Explain Least Cost Method.

Q.5 Discuss Vogel's Approximation Method. **(14)**

OR

Explain Transportation Algorithm.

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Term End Examination January-2016

Course	: Diploma in Operation Research **(DOR)**	**Numerical Code: 0030**
Subject	: PERT & CPM **(DOR-03)**	**Numerical Code: 0190**
Date	: **29/01/2016**	**Roll No._____**
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 PERT and CPM **(14)**

OR

Explain Phases of project Management

Q.2 Discuss PERT/ CPM Network Components and Precedence Relationships **(14)**

OR

Explain Critical Path Analysis

Q.3 Discuss Forward Pass Method and Backward Pass Method **(14)**

OR

Explain Float of an Activity and Event

Q.4 Discuss Critical Path **(14)**

OR

Write short note on: Project Scheduling with uncertain Activity Times

Q.5 The following table gives data on normal time and expense and crash time and expense for a project of a company **(14)**

Activity	Normal		Crash	
	Time (Weeks)	Expense (₹)	Time (Weeks)	Expense (₹)
1-2	3	300	2	400
2-3	3	30	3	30
2-4	7	420	5	580
2-5	9	720	7	810
3-5	5	250	4	300
4-5	0	0	0	0
5-6	6	320	4	410
6-7	4	400	3	470
6-8	13	780	10	900
7-8	10	1,000	9	1,200

Indirect expense is ₹ 50per week

a. Draw the network and identify the Critical path with a double line
b. What are the normal project duration and associated expense?
c. Find out the total float associated with each activity
d. Crash the relevant activities systematically and determine the optimal project Completion time and expense.

OR

Write short note on Any Two

1. Project Crashing
2. Time Expense Trade-off Procedure
3. Resource Smoothing

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Term End Examination January-2016

Course	: Diploma in Operation Research **(DOR)**	**Numerical Code: 0030**
Subject	: PERT & CPM **(DOR-04)**	**Numerical Code: 0191**
Date	: **29/01/2016**	**Roll No._____**
Time	: **03.00 to 06.00**	
N.B.	: All questions carry equal Marks.	**Total Marks : 70**

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1. Write short note on maximax criteria of decision making **(14)**

OR

State the types of enviorment under which decisions can be made.

2. Explain the decision tree approach in decision making. **(14)**

OR

Explain the techniques to deal with risk.

3. Explain with detail summarise EMV and EOL criteria. **(14)**

OR

Explain sensitivity analysis as a risk reducing ineasure in capital budgeting.

4. What a maximam amount can be paid for obtaining perfect information for forth coming activities ? **(14)**

OR

Classify the degree of certainty with explanation

5. Holding expense for an unit is Rs.200 loosing a customer costs Rs.500 and the probability distribution of a demand is as under find expected monetary value.**(14)**

Demand	0	1	2	3	4	5
Probability	0.05	0.1	0.2	0.3	0.2	0.15

OR

The ABC Ltd. manufacture guaranteed tennis balls at present time, approximately 10 percent of the tennis balls are defective,A defective ball leaving the factory expenses the company Rs.0.50 to honour its guarantee. Assume that all defective balls are returned , at a expenses at Rs.0.10 per ball,the company can conduct a test which always correctly icleutifies both good and bad tennis ball.

(a) Draw a decision tree and determine the optimal course of action and its expected expenses.
(b) At what test expense the company should be indifferent to testing?