

St. Joseph's College of Commerce (Autonomous)
#163, Brigade Road, Bangalore - 560 025

LESSON PLAN (MODULE WISE)

COURSE: B.COM., REGULAR
SEMESTER: VI
SUBJECT: OPERATIONS RESEARCH

Lecture Hours: 60

OBJECTIVE: To provide a good foundation in the mathematics of operation research and appreciation of its potential application for decision making in the business world.

Sl. No	UNIT & OBJECTIVES	No. of Lecture Hours	Methodology/ Instructional Techniques	Evaluation/ Learning Confirmation
MODULE 1	<u>Introduction to Operations Research:</u> Objective: To understand to meaning, definition, scope, nature, models and applications of Operations Research.	4		
1.	Meaning – Nature and Scope of Operations Research	1	Lecture and PPT	Question and Answer
2.	OR Models	1	Lecture and Illustrations	Question and Answer
3.	Nature and Limitations of OR	1	Lecture and Illustrations	Question and Answer
4.	Applications of OR	1	Lecture	Question and Answer
MODULE 2	<u>INTRODUCTION TO LINEAR PROGRAMMING</u> Objective: To construct LP Model and solve Maximization and Minimization Problem graphically.	12		
1.	Basic concepts – Construction of LP model	1	Lecture and Illustrations	Question and Answer
2.	Problems on Formulation of LP Model	1	Lecture, Problems and Solutions	Question and Answer
3.	Problems on Formulation of LP Model	1	Lecture, Problems and Solutions	Question and Answer
4.	Problems on Graphical LP Solution - Maximization	1	Lecture, Problems and Solutions	Question and Answer
5.	Problems on Graphical LP Solution - Maximization	1	Lecture, Problems and Solutions	Question and Answer
6.	Problems on Graphical LP Solution - Maximization	1	Lecture, Problems and Solutions	Question and Answer
7.	Problems on Graphical LP Solution - Maximization	1	Lecture, Problems and Solutions	Question and Answer
8.	Problems on Graphical LP Solution - Minimization	1	Lecture, Problems and Solutions	Question and Answer
9.	Problems on Graphical LP Solution - Minimization	1	Lecture, Problems	Question and

			and Solutions	Answer
10.	Problems on Graphical LP Solution - Minimization	1	Lecture, Problems and Solutions	Question and Answer
11.	Problems on Graphical LP Solution - Minimization	1	Lecture, Problems and Solutions	Question and Answer
12.	Revision	1	Revision	Test/ Assignment/ MCQ
MODULE 3	<u>SIMPLEX METHOD</u> Objective: To understand the meaning and use of slack, surplus and artificial variables, to solve Maximization and Minimization problems and construct Duality to a given model.	14		
1.	Introduction- Standard LP form and basic solutions	1	Lecture and Illustrations	Question and Answer
2.	Problems on instruction of Slack Variables	1	Lecture, Problems and Solutions	Question and Answer
3.	Problems on instruction of Surplus Variables	1	Lecture, Problems and Solutions	Question and Answer
4.	Problems on instruction of Artificial Variables	1	Lecture, Problems and Solutions	Question and Answer
5.	Problems on Maximization	1	Lecture, Problems and Solutions	Question and Answer
6.	Problems on Maximization	1	Lecture, Problems and Solutions	Question and Answer
7.	Problems on Maximization	1	Lecture, Problems and Solutions	Question and Answer
8.	Problems on Maximization	1	Lecture, Problems and Solutions	Question and Answer
9.	Problems on Minimization – Big M Method	1	Lecture, Problems and Solutions	Question and Answer
10.	Problems on Minimization – Big M Method	1	Lecture, Problems and Solutions	Question and Answer
11.	Problems on Minimization – Big M Method	1	Lecture, Problems and Solutions	Question and Answer
12.	Problems on Minimization – Big M Method	1	Lecture, Problems and Solutions	Question and Answer
13.	Minimization of LPP – Duality	1	Lecture, Problems and Solutions	Question and Answer
14.	Minimization of LPP – Duality	1	Lecture, Problems and Solutions	Question and Answer
MODULE 4	<u>TRANSPORTATION PROBLEM</u> Objective: To understand the meaning of Transportation Model, methods of finding the Initial Solution by using different methods and Testing for Optimality.	14		
1.	Meaning – Introduction to transportation models – Loops in transportation table and its properties	1	Lecture	Question and Answer
2.	Problems on finding out Initial Solution under North-west Corner Method	1	Lecture, Problems and Solutions	Question and Answer
3.	Problems on finding out Initial Solution under	1	Lecture, Problems	Question and

	North-west Corner Method		and Solutions	Answer
4.	Problems on finding out Initial Solution under Least Cost Cell Method	1	Lecture, Problems and Solutions	Question and Answer
5.	Problems on finding out Initial Solution under North-west Corner and Least Cost Cell Method	1	Lecture, Problems and Solutions	Question and Answer
6.	Problems on finding out Initial Solution under VAM Method	1	Lecture, Problems and Solutions	Question and Answer
7.	Problems on finding out Initial Solution under VAM Method	1	Lecture, Problems and Solutions	Question and Answer
8.	Economic interpretation of U_i 's and V_j 's	1	Illustration	Question and Answer
9.	Testing for Optimality-MODI method	1	Lecture, Problems and Solutions	Question and Answer
10.	Testing for Optimality-MODI method	1	Lecture, Problems and Solutions	Question and Answer
11.	Testing for Optimality-MODI method	1	Lecture, Problems and Solutions	Question and Answer
12.	Testing for Optimality-MODI method	1	Lecture, Problems and Solutions	Question and Answer
13.	Testing for Optimality-MODI method	1	Lecture, Problems and Solutions	Question and Answer
14.	Trans- shipment Problems	1	Lecture, Problems and Solutions	Question and Answer
MODULE 5	<u>ASSIGNMENT PROBLEM</u> Objective: To understand the meaning of Assignment Problems and to solve it using Hungarian Method.	8		
1.	Introduction-Mathematical statement of the Problem- Methods of solving Assignment problem	1	Lecture	Question and Answer
2.	Enumeration- Simplex and Transportation (Theory)	1	Lecture and Illustrations	Question and Answer
3.	Enumeration- Simplex and Transportation (Theory)	1	Lecture and Illustrations	Question and Answer
4.	Problem on Transportation using Hungarian Method	1	Lecture, Problems and Solutions	Question and Answer
5.	Problem on Transportation using Hungarian Method	1	Lecture, Problems and Solutions	Question and Answer
6.	Problem on Transportation using Hungarian Method	1	Lecture, Problems and Solutions	Question and Answer
7.	Problem on Transportation using Hungarian Method Hungarian Method	1	Lecture, Problems and Solutions	Question and Answer
8.	Problem on Transportation using Hungarian Method	1	Lecture, Problems and Solutions	Question and Answer
MODULE 6	<u>NETWORK ANALYSIS</u> Objective: To develop a Project Network, determine Time Estimates, calculating various floats and identifying the Critical path and Project Completion Time.	8		
1.	Introduction and guidelines for construction of network diagram	1	Lecture and Illustrations	Question and Answer
2.	Deterministic time Estimates-developing a Project	1	Lecture and case	Question and

	network		study problems	Answer
3.	Deterministic time Estimates-developing a Project network	1	Lecture and case study problems	Question and Answer
4.	Project duration and critical Path-forward pass-backward pass-float	1	Lecture, Problems and Solutions	Question and Answer
5.	Project duration and critical Path-forward pass-backward pass-float	1	Lecture, Problems and Solutions	Question and Answer
6.	Project duration and critical Path-forward pass-backward pass-float	1	Lecture, Problems and Solutions	Question and Answer
7.	Probabilistic Time Estimates	1	Lecture and Problems	Question and Answer
8.	Difference Between PERT and CPM	1	Lecture	Question and Answer

Books for Reference:

1. Operation Research by S. Kalavathy .S. – Vikas Pub Co.
2. Operation Research by Sharma J.K. – Mc Millan, New Delhi.
3. Quantitative Techniques, System Analysis and Data Processing by V.K. Kapoor – Sultan Chand.

DATES & NATURE OF CIA:

1. First Unit Test 10 marks - between December 5th -10th, 2015 – Written Test.
2. Mid Term Exams 30 marks – Jan end, 2016.
3. Second CIA for 10 marks – between Feb 15-20th, 2015 – Assignment/Project.

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