

AC 7/6/2013

Item no.4.27

T.Y.B.Com Elements of Operations Research Semester wise Syllabus with effect from Academic Year 2013-2014 onwards

Syllabus : SEM V

Workload: 3 Lectures per week

Pre-requisites: Use of Normal Distribution in finding Probabilities. Concept of present value of money. Application of derivatives to obtain minima of Cost functions

UNIT I:

Introduction: Meaning and scope of Operations Research, Applications in Business, Commerce and Industry, limitations of Operations Research. (15 Lectures)

Replacement Theory: Replacement Models for items that deteriorate with time assuming value money i) constant ii) changes with time. Replacement of items that fail completely using individual and Group replacement.

UNIT II:

Linear Programming Problems (LPP) : Mathematical Formulation of LPP . Solution to the LPP using Graphical Method, Simplex Method and Big M method Duality in LPP. Detection of optimum solution to primal using optimum solution to the dual. (15 Lectures)

UNIT III:

Transportation Problem: Description and Formulation of (15 Lectures)

Transportation Problem Initial Basic Feasible Solution by i) North West Corner Rule, ii) Least Cost Entry Method (Matrix Minima), iii) Vogel's Approximation Method. Optimum Solution by MODI Method. Existence of Alternative optimum solution. Impact of change in some cost Coefficients on optimum solution. Maximization type and Unbalanced Transportation Problems.

Paper pattern for Semester V:

Question No	Unit No and Topic name	Marks	Marks with internal options
Q.1	I Replacement	10	30
	Introduction to Operations Research	5	
Q.2.	II LPP	15	30
Q.3.	III Transportation Problem	15	30
Q.4	True or False and MCQ s based on units I,II,III with equal weightage for all the units	15	15

SYLLABUS SEMESTER VI

UNIT IV :

Project Analysis: Basic concepts and Definitions, Gantt Charts and its weaknesses, CPM and PERT networks, Numbering of Events, Contractual Obligation Time, Earliest occurrence time, Latest allowable occurrence Time and Slack Time for Events, Different types of floats for activities. Critical Path Calculations, Probability Assessment in PERT Networks. Time Cost Trade – Off Analysis for CPM Networks. (15 Lectures)

UNIT V:

Theory of Games : Basic Concept and Definitions. Two Person Zero Sum Game. Saddle point, Pure and Mixed Strategies. (15 Lectures)

Reducing the size of the game using dominance property.
 Optimum Solution to a 2x2 game without saddle point.
 Graphical solution to 2xn and mx2 games.

UNIT VI:

Inventory Models: Costs in Inventory management (15 Lectures)
 Deterministic Inventory Models- EOQ Model with Instantaneous Replenishment and Constant Rate of Demand Assuming that shortages are not allowed (Mathematical derivation expected), its price break model. Other EOQ models with instantaneous/uniform rate of replenishment and constant rate of demand assuming shortages are allowed/not allowed.

Paper pattern for SEMESTER VI

Question No	Unit No and topic name	Marks	Marks with internal options
Q.1	IV Project Analysis	15	30
Q.2	V Game Theory	15 (8+7)	30
Q.3	VI Inventory Models	15 (8+7)	30
Q.4.	True or False and MCQ s based on units IV,V and VI with equal weightage for all the units	15	15

References :

1. PERT & CPM Principles and Applications by L.S.Srinath
2. Operations Research Principles & Practice by Ravinderan, Phillips Solber.
3. Schaum’s outline series Theory & Problems of Operations Research by Richard Bronson
4. Operations Research by H.A.Taha
5. Operations Research by Gupta & Hira
6. Operations Research Theory & Applications by J.K.Sharma

7. Operations Research Problems & Solutions by V.K.Kapoor
8. Quantitative Techniques by Shenoy, Shrivastav & Sharma
9. Introduction to Operations Research by Hiller & Lieberman
10. Operations Research Techniques for Management by B.Banerjee
11. Operations Research by Gupta & Manmohan
12. Quantitative Techniques by N.D.Vohra

Guidelines for Project work:

Presentation of case studies enlisted in recent O.R. books, on Application-oriented topics in O.R. like Caterer's problem, Flight Scheduling, Stocking problems, Production Scheduling, Trim-loss reduction, etc.

Demonstrating uses of computer packages like Tora, QSB, QM, etc. for solving O.R. problems with Numerical illustrations.

Formulating O.R. models for live situations like Admission Process for educational institutes, event management, etc.

Book/Internet articles Review.

The other guidelines about the project be as per University Circular (UG/291 of 2006 dated 2nd August, 2006)

Scheme of Examination: As per University norms under Semester Based Credit and Grading System .

