UNIVERSITY OF MUMBAI
No.UG/377 of 2008

CIRCULAR :-

A reference is invited to the Ordinances, Regulations and Syllabi relating to the Bachelor of Commerce (B.Com.) degree course vide this office Circular No.UG/203 of 1998, dated 3rd June, 1998 and the Principals of the affiliated colleges in Commerce and the Professor-cum-Director, Institute of Distance Education are hereby informed that the recommendation made by the Board of Studies in Statistics at its meeting held on 12th March, 2008 has been accepted by the Academic Council at its meeting held on 15th April, 2008 vide item No.4.10 and that, in accordance therewith, the syllabus in the subject of "Elements of Operation Research" (Applied Component) at the T.Y.B.Com. examination has been revised as per Appendix and that the same has been brought into force with effect from the academic year 2008-2009.

Further, that the pattern of question paper at the T.Y.B.Com. examination in the subject of Elements of Operation Research (Applied Component) is as per Appendix and that the same has been brought into force with effect from the examination to be held in first half of 2009.

MUMBAI-400 032
13th August, 2008

PRIN. K. VENKATARAMANI
REGISTRAR

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To,

The Principals of the affiliated colleges in Commerce and the Professor-cum Director, Institute of Distance Education.

AC/4.10/15.04.2008

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No.UG/377-A of 2008, MUMBAI-400 032 13th August, 2008.

Copy forwarded with compliments for information to :-

1) The Dean, Faculty of Commerce
2) The Chairman, Ad-hoc Board of Studies in Statistics.
3) The Controller of Examinations,
4) The Co-ordinator, University Computerization Center.

13/08

(D.H.KATE)
DEPUTY REGISTRAR
(U.G./P.G. Section)

Enclosure to Item No.4.10
15.4.08

UNIVERSITY OF MUMBAI

Revised Syllabus

and

Pattern of Question Papers

of

Elements of Operation Research
(Applied Component)

at

T.Y.B.Com.examination

(With effect from the academic year 2008-2009)

Revised Syllabus in the subject of "Elements of Operations Research" (A.C.) at T.Y.B.Com. to be brought into effect from the academic year 2008-09 and thereafter.

Workload : 3 periods per week.

Prerequisites : Use of Normal distribution in finding probabilities. Concept of present value of money. Application of derivatives to obtain minima of cost function.

UNIT I :

Introduction : Meaning and scope of Operations Research, Applications in Business, Commerce and Industry, Limitations of Operations Research.

Replacement Theory : Replacement Models for items that deteriorate with time assuming value of money (i) is constant and (ii) changes with time. Replacement Policy of items that fail completely using individual and group replacement. [15]

UNIT II :

Project Analysis : Basic Concepts and Definitions, Gannt 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]

UNIT III :

Transportation Problem : Description and Formulation of 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. Maximisation type and Unbalanced Transportation Problems. [15]

(...2/-)

UNIT IV :

Linear Programming Problems (LPP) : Mathematical Formulation of a 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]

UNIT V :

Theory of Games : Basic Concept and Definitions. Two Person Zero Sum Game. Saddle point, Pure and Mixed Strategies. Reducing the size of the game using dominance property. Optimum Solution to a 2 X 2 game without saddle point. Graphical solution to 2 X n and m x 2 games. [15]

UNIT VI :

Inventory Models : Costs in Inventory Management 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 that shortages are allowed/not allowed. [15]

References :

1. PERT and CPM Principles and Applications by L. S. Srinath.
2. Operations Research Principles and Practice by Ravinderan, Phillips Solbei.
3. Schaum's Outline Series Theory and Problems of Operations Research by Richard Bronson.
4. Operations Research by H. A. TAHA
5. Operations Research by Gupta and Hira.
6. Operations Research Theory and Applications by J. K. Sharma.
7. Operations Research Problems and Solutions by V. K. Kapoor.
8. Quantitative Techniques by Shenoy, Srivastav and Sharma.
9. Introduction to Operations Research by Hiller and Lieberman.
10. Operations Research Techniques for Management by B. Banerjee.
11. Operations Research by Gupta & Manmohan.

(... 3/-)

.....2/-

The pattern of examination at T.Y.B.Com. in the subject of 'Elements of Operations Research' (Applied Component) to be brought in to force from First Half Examination of 2009, March/April, 2009.

1. The students who will be keeping the terms at T.Y.B.Com. during the academic year 2008-2009 and onwards shall be having project work of 20 marks. These students shall have theory examination of 80 marks and 2½ hours duration.

2. The students who either have kept terms before academic year 2008-2009 or have enrolled thro' distance education shall have theory exam of 100 marks and 3 hours duration.

3. The question paper shall consist of two sections viz. Section A (80 marks) and Section B (20 marks).

4. The students who belong to the category specified by paragraph 1 (as above) shall attempt Section A only. The students who belong to the category specified by paragraph 2 (as above) shall attempt both the sections viz. Section A and Section B.

5. Students are allowed to use Hand Held Non-programmable scientific calculators for examination.

6. Pattern of question paper :-
All questions are compulsory. Section A shall consist of 5 questions carrying 16 marks each with internal options. Section B shall consist of one question of 20 marks with internal options. Section A shall be drawn over the entire syllabus giving due weightage to each topic in the prescribed syllabus.

(...4/-)

7. The guidelines for the project work are as follows :
Presentation of case studies, enlisted in recent O.R. books, on application oriented topics in O.R. like caterer's problem, flight scheduling, staffing problem, production scheduling, Trim loss reduction etc.

Demonstrating use of computer packages like TORA, QSB, QM etc. for solving a OR problem with a numerical illustration.

Formulating a OR model for live situations like admission process for educational institute, 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.

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