4th Revised Edition

Quantitative Techniques and Operations Research

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Quantitative Techniques
&
Operations Research

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Author's Acknowledgement : The writing of a Textbook always involves creation of a huge debt towards innumerable author's and publications. We owe our gratitude to all of them. We acknowledge our indebtedness in extensive footnotes throughout the book. If, for any reason, any acknowledgement has been left out we beg to be excused. We assure to carry out correction in the subsequent edition, as and when it is known.

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Preface

This book has been designed primarily for BBA students of GGS Indraprastha University, NEW DELHI and other similar undergraduate courses in quantitative techniques of other universities.

Salient Features :

- The book covers syllabus of Quantitative Techniques & Operations Research paper of BBA completely. The students need to buy only one book instead of separate books on Statistics and Operations Research.
- There are detailed self-contained chapters on all the syllabus elements and are divided into two parts. Part I deals with the statistical techniques and Part II gives the operations research techniques.
- Part I of the book starts with chapter 0 giving meaning, classification of quantitative techniqes, its role in business and industry, and applications to real life problems. Chapter 1 deals with the meaning,uses, functions and limitations of statistics. Chapter 2 onwards discusses the classification of data, measures of Central Tendency, measures of Variation, Correlation, and Regression analysis.
- Part II starts with chapter 1 giving definition, modelling, methodology, applications and scope of operations research. Chapter 2 introduces the concept of linear programming and then familiarize the students with the Formulation of linear programming models. Methods for solving the linear programming problems, duality, transportation, and assignment problems that cover comprehensively the syllabus are discussed in chapter 2 through 6. Managerial applications are discussed at length.
- Chapter 7 on "Operations Scheduling" has been dealt with at greater length owing to its increasing importance in the current business environment.
- The language is simple and subject matter has been presented in a lucid and straight forward style and is self-explanatory. Special care has been taken to develop the concepts in a easy to understand manner.
- A sufficient number of solved examples and illustrations are given in each chapter to explain the various techniques of Statistics and Operations Research.
- Unsolved questions are given in the form of exercises followed by their answers for self practice.
- At the end of each chapter, conceptual questions in the form of "Test Your Understanding" and "Multiple - choice Questions" have been presented. These are followed by "Review Exercise" based on the theoretical questions dealt within the chapter.

Authors are grateful to Dr. Priyanshu Gupta, Assistant Professor, Indian Institute of Management, Lucknow for his valuable suggestions during revision of the book.

It is our firm belief that the book in its present form will be found most helpful by the undergraduate students of BBA and other similar courses.

Suggestions for improvement shall be gratefully received and duly acknowledged.

October 25, 2021 AUTHORS

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G.G.S. Indraprastha University
B.B.A.—Second Semester

QUANTITATIVE TECHNIQUES & OPERATIONS RESEARCH IN MANAGEMENT

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About the Book

This book on Quantitative Techniques and Operations Research provides a conceptual understanding of basic quantitative techniques/methods used in solving managerial problems. It discusses comprehensively the essential topics of quantitative decision-making by using illustrations and examples. With revised and updated contents, this edition of the book will be useful to the students pursuing the undergraduate programme in Management and Commerce.

New in this Edition

- The chapters on Linear Programming Problems are rewritten and have been designed to take the reader through gradual increase in complexity. Chapter 2 of part II is completely dealt with the formulation of linear programming models from business and economics.
- Given its importance in the current business environment, chapter on Operations Scheduling has been dealt with at length.

About the Authors

Dr. S P Gupta (born 1942) has a brilliant academic record of teaching for more than 4 decades in Indian and Foreign Universities. He was a student of Shri Ram College of Commerce, University of Delhi. He obtained B.Com. (H) and M.Com. Degree with "Advanced Statistics" as specialization and taught for more than a decade in SRCC.

He was invited by the Tribhuvan University, Kathmandu, Nepal as visiting professor for a period of 2 years. He was also appointed visiting Professor in Karl Marx University, Milano for a period of 1 year. He attended prestigious International Teachers Program in Stockholm (Sweden) and Budapest, Hungary.

Dr. Gupta joined Faculty of Management Studies (FMS), University of Delhi from where he obtained Ph.D degree in Management and taught for about 3 decades. He has authored more than a dozen books in the field of Statistics for B.Com., M.Com., MBA, CA, ICWA courses etc. He was also Head & Dean, Faculty of Management Studies, University of Delhi for a period of 3 years.

Dr. P K Gupta has over three decades of experience in teaching Mathematics and Operations Research to undergraduate and Post-Graduate students. He obtained a master's degree in Mathematics, and then another one in Operations Research from the University of Delhi. He obtained his doctorate in 1977 in the field of Queuing Theory.

He served as a faculty member in various capacities at the Department of Mathematics, JV Jain College, Saharanpur; where he taught a range of topics on Mathematics and Operations Research. These included Boolean Algebra, Linear Algebra, Difference Equations, Graph Theory and Techniques of Operations Research.

In 1979, he was invited by the Cochin University of Science & Technology, Kochi (Kerala) to teach the students of their newly started diploma course in Operations Research and Computer Applications. He also has been actively engaged in research in the discipline. He supervised multiple Ph.D. scholars in Optimization of Queues and also applied optimization techniques in paper industry. He has authored more than half a dozen books of Mathematics and Operations Research, in addition to multiple research publications.

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