Syllabus for M.Phil (Statistics) Course, 2017-18

Scheme of Examination

S.No.	Title of the Paper	Max.Mark
1.	Paper – I Research Methodology ,Quantitative Methods & Computer application	100
2.	Paper – II Advanced Operations Research	100
3.	Lab Course : Based on Theory Papers I & II	100
4.	Dissertation	200
5.	Seminar & Viva-voce on Dissertation	100
	Total Marks	**600**

Paper-I

Research Methodology, Quantitative Methods & Computer applications

Unit I

Research methodology: An introduction, meaning of research, objective of research, Research Methods versus Methodology, Selection of research problem, Necessity of defining the problem. Technique involved in Defining a problem. Methods of Data Collection: Collection of Primary data, construction of questionnaire, Collection of data through questionnaire, Difference between questionnaires and schedules ,Some other methods of data collections, Collection of Secondary data, Processing and analysis of data. Use of Statistical packages, SPSS for data analysis.

Unit II

A review of Simple Random Sampling, Estimation of population proportion, Stratified sampling, Optimum Allocation, Practical difficulty in adopting Neyman Allocation, formation of strata. Systematic sampling. PPS sampling, Multistage sampling.

Unit III

The structure and formation of a linear programming problem,Graphical and simplex procedure,Two phase methods, and charne's-M method with artificial variables ; duality theorem. **T**ransportation and Assignment problems, Routing and traveling salesman problem. Inventory problems – Deterministic models of inventory , Economic Lot size formula ,instantaneous production case ,finite production rates

situation ,cases when shortages are allowed /not allowed. Stochastic inventory models – a single period model with no set up cost.

UNIT-IV
Acceptance sampling plans for attribute inspection ; single, double and sequential sampling plans and their properties ; Bayesian sampling plan. Plans for inspection by variables for one-sided and two-sided specifications; Continuous sampling plans of Dodge type and Wald-Wolfiwitz type and their properties

UNIT-V
 Four short notes, one from each unit will be asked. Students have to answer any two.

References:

1. Freedman,P.,"The Principles of Scientific Research,2nd ed.,new York Pergamon Press,1960

2. Gaum,Carl G.,Graves ,Harod F.,and Hoffman ,Lyme,S.S.,Report Writing ,New York : Barnes & Noble ,Inc,1956.
3. Weller;S.;Romney,A,"Systematic Data Collection ",(Qualitative Research Method   Series 10)
4. C.R.Kothari,"Research Methodology", Second Edition, Wishwa Publication, Wiley Eastern Limited, New Delhi.
5. Mukhopadhyay, P. (1998): Theory and methods of Survey Sampling , Prentice-Hall of India Pvt. Ltd. New Delhi.
6. Sukhatme ,P.V. Sukhatme,B.V. Sukhatme S. and Ashok,C.(1984):Sampling Theory of Survey with Applications, IASRI Publication, New Delhi.

Paper-II

Operations Research

Unit I
 Definition and scope of Operational Research ; phases in Operations Research; models and their solutions ; decision –making under uncertainty and risk, use of different criteria; The structure and formation of a linear programming problem, Graphical and simplex procedure, Two phase method and Charne's M-method.

Unit II
Review of LPP Advanced Linear Programming, Validity Proofs of the Simplex Method , Generalized Simplex Tableau in Matrix Form, Efficient Computational Algorithms, Duality LPP, Goal Programming, A Goal-Programming Formulation, Goal-Programming Algorithms, Integer Linear Programming, Applications of Integer-Programming and Solution Algorithms.

Unit III

Decision Environments, Decision-Making under Certainty, Decision-Making under Risk, Decision under Uncertainty. Concept of games and strategy , Pure and mixed strategies, saddle point of a matrix game, Graphical method, Dominance Principle, LPP method for solving games.

Unit IV
Project Management : PERT and CPM, Basic Differences between PERT and CPM, Steps of PERT/CPM Techniques, PERT/CPM Network Components and Precedence Relationships, Critical Path Analysis, Probability in PERT Analysis Project Time Cost Trade off, Updating of the Project, Resource Allocation.
UNIT-V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCE:

1. Hamdy A. Taha : Operations Research an : Introduction. Prentice-Hall India

2. J. K. Sharma : Operations Research : Theory and Applications. Macmillan India Limited.

3. Olvi L Mangasarian : Non Linear Programming : Tata McGraw-Hill Publishing Company Ltd.