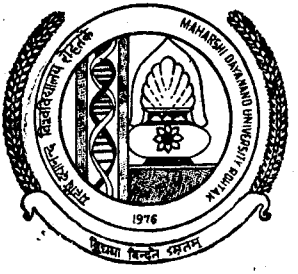
Maharshi Dayanand University
Rohtak



Ordinances, Syllabus and Courses of Reading for M.Phil. Statistics Examination

Session—1999-2000

Available from :
Deputy Registrar (Publication)
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Rohtak-124 001 (Haryana)

Price :
At the Counter : Rs. 50/-
By Regd. Parcel : Rs. 75/-
By Ordinary Post : Rs. 60/-

ORDINANCE : MASTER OF PHILOSOPHY EXAMINATION

1. The duration of the course of instruction for the M. Phil. examination shall be one year. The examination shall ordinarily be held annually in the month of April on the date fixed by the Vice-Chancellor. The dates fixed under this clause shall be notified to the respective Heads of the Departments.

   A special examination will be held in September/October or on such date fixed by the Vice-Chancellor for those candidates who get re-appear after appearing in the M. Phil. Exam. or fail or want to improve their score. However, total number of chances will not exceed as given in the Ordinance.

2. The last date for the receipt of admission form and fee, without late fee as fixed by the Vice-Chancellor, shall be notified to the Heads of the University Teaching Departments.

3. A candidate's admission form and fee may be accepted after the last date on payment of late fee of Rs. 105/- upto the date notified by the University.

Note : No late fee shall be charged if the admission form and fee are received within three working days of grace after the last date for the receipt of the same without late fee.

4. A person who has passed Master's Degree in a relevant subject of the M.D. University or an examination recognised as equivalent thereto with atleast second division (50% marks or Grade 'C' in the seven point scale) shall be eligible to seek admission to M .Phil. Course.

5. The examination in M.Phil. shall be open to a student whose name is submitted to the Registrar/ Controller of Examinations by the concerned Head of the University Department, he has most recently attended and produced the following certificates signed by the Head of the University Department :-

   i) of having remained on the rolls of the University Department for the academic year preceding the examination;

ii) of having attended not less than 65% of lectures delivered (the course to be counted upto the last day when the classes break up for the preparatory holidays) and having attended and participated in at-least six seminar organised by the Department during the academic year.

6. A candidate shall submit his admission application on the prescribed form with the required certificate duly countersigned by the University Head of the Department.

7. The amount of the admission fee for the Examinaton to be paid shall be as under:-

	Regular Students	Ex-Students
M.Phil. Arts	Rs. 100/- Plus (Rs. 100/-Dissertation and Rs. 25/- practical)	Rs. 115/-
M.Phil. Science	Rs. 110/- Plus (Rs. 100/- Dissertation and Rs. 25/- practical)	Rs. 125/-
M.Phil. Commerce	Rs. 100/- Plus (Rs. 100/- Dissertation and Rs. 25/- practical)	Rs. 115/-

A candidate reappearing in paper(s) shall pay fee as for the whole examination.

8. The medium of instructions shall be English except in case of Hindi where it shall be Hindi and in case of Sanskrit it shall be English or Hindi or Sanskrit:

The medium of Examination shall be as under :-

The questions paper shall be set in English Except in case of Hindi where these shall be set in Hindi and in case of Sanskrit where these shall be set in English or Hindi or Sanskrit. The candidates shall write their answer as under :-

i) The subject under the Faculty of Social Sciences :- Hindi or English

ii) Faculty of Humanities

a) In case of English	:	English
b) In case of Hindi	:	Hindi
c) In case of Sanskrit	:	Hindi/Sanskrit/English

(In the case of dissertation of M.Phil. (Sanskrit), the option of writing the same in English,Hindi or Sanskrit may be allowed irrespective of the option the candidates may have offered for the theory papers.

iii)The subjects under the Faculties of Physical Sciences, Life Sciences and Commerce & Business Management	:	English
iv) Faculty of Education	:	English/Hind

9. The examination for M.Phil shall consist of papers of 100 marks each and there shall be 150 marks for dissertation and 50 marks for viva-voce.

The evaluation of dissertation and viva-voce examination shall be done/conducted by the Board of Examiners consisting of one external examiner, the supervisor of the candidate. In case there is a dispute, the Head of the Deptt. will act as moderator and his decision will be final.

10. The evaluation of seminar may be held internally by the Dept. before the end of the Academic Year and the evaluation of select reading may be done at the time of viva-Voce or

dissertation by the external examiner. The Board of Examiners for evaluating the seminar shall be appointed by the Head of the Deptt. and shall consist of the supervisor of the candidate and two more teachers of the Deptts. participating in M.Phil. Course.

11. A candidate who has failed in one or more paper(s) or having been eligible fails to appear in M.Phil. Examination, for valid reasons, may be allowed on the recommendations of the Head of the Dept. concerned, to appear/reappear in the paper(s) within the period of three years of his admission to the course. Such a candidate shall be exempted from reappearing in the paper(s) in which he may have obtained at least 50% marks.
12. A candidate who does not complete the requirements for the award of degree within the period of three years of his admission to the course shall be declared to be unfit for M.Phil course of this University in the subject concerned. This is however, subject to Clause 15 below.
13. A candidate who has passed the M.Phil. examination obtaining less than 60% marks may reappear once in the next two years of passing the M.Phil Examination in one or more theory paper(s) to improve the grade.
14. The subject of Dissertation/Project Work/Design Work of a candidate shall be approved by the Departmental M.Phil. Committee, consisting of the teachers participating in the M.Phil. teaching. The applications regarding the same and the synopsis thereof shall reach the Head of the Deptt. concerned by the dates to be notified by him for the purpose.

    The Departmental M.Phil. Committee shall consider the topic/synopsis and approve the same with such modification as it may deem fit. The Head of the Deptt. shall also appoint Supervisor(s) for the dissertation.
15. The candidates will be required to submit the dissertation in the office of the Registrar/Controller of Examinations by the end of the academic year. However, the Head of the Deptt.

may grant a candidate, on genuine grounds, extension upto six months to submit the dissertation. The Vice-Chancellor may allow further extension in case the student is not able to complete his dissertation in the extended time. The dissertation in such cases, will be considered for the award of Degree in the next academic year.

16. The Examination shall be held according to the syllabus prescribed by the Academic Council . A candidate who fails in an examination, or having been eligible,fails to appear in an exam. who takes the Examination under Clause-11 shall unless approved otherwise by the Academic Council take the examination as an ex-student ,according to the syllabus prescribed for regular students appearing for that Examination, provided that the syllabus for the candidates appearing in the supplementary examination to be held in September/October shall be the same as was in force for the regular students in the last annual examination.

17. The minimum number of marks required to pass the M.Phil. Examination shall be as under:-

    i) 45% marks in each written paper/ practical .

    ii) 50% marks in seminars/select reading.

    iii) 50% marks in the aggreate.

Further the dissertation including viva-voce shall be adjudged as under:-

Grade	Numerical value
A+	9
A only	8
B+	7
B only	6
C+	5
C only	4
F	Fail

The result of a candidate shall be declared only if his dissertation etc. has been evaluated minimum as grade 'C' only.

The list of the successful candidates shall be arranged as under:-

a) A candidate who have secured 60% or above marks shall be considered to have passed in the First Division.

b) Candidates who have secured 50% or above but below 60% shall be considered to have passed in second division.

c) The grade obtained by a candidate in dissertation and viva-voce shall be mentioned separately .

d) Candidates who have secured less than 50% marks in written papers etc. and grade 'F' in dissertation and viva-voce shall be considered to have failed in the Exam.

18. The tuition fee for the student of M. Phil. Course shall be the same as for the M.A. student. Tuition fee for M. Phil course shall not be charged from the teachers in the University or its affiliated colleges.

19. A successful candidate may, if permitted by the Head of the Deptt. publish wholly or in part his Dissertation as a paper in journals of repute.

20. The Ordinance in force at the time a student joins the course shall hold good only for the examination held during or at the end of academic year and nothing in this Ordinance shall be deemed to debar the University from amending the Ordinance and the amended Ordinance, if any, shall apply to all students, whether old or new.

21. Candidates admitted to the M.Phil. course in 1990-91 or earlier shall be governed by the old rules. The new rules shall be applicable w.e.f. the admission of the academic session 1995-96.

Scheme of Examination for M.Phil. (Statistics) 1999-2000

The duration of the course of instructions of M.Phil. (Statistics) degree shall be one year. There will be, three theory papers each of 100 marks, a seminar paper of 100 marks and a dissertation, to be submitted by the candidate during the course of study of 200 marks. The detailed scheme of the course is as given below :

		Max. Marks	Time
Paper-I	Stochastic Processes	100	3 Hrs.
Paper-II & III : Any two of the followings			
Opt. (i)	Demography and Advanced Theory of Sample Surveys	100	3 Hrs.
(ii)	Non-Parametric Inference and Statistical Genetics.	100	3 Hrs.
*(iii)	Advanced Inference and Multivariate Analysis	100	3 Hrs.
*(iv)	Advanced Econometric Methods and Design of Experiments	100	3 Hrs.
*(v)	Advanced Operation Research	100	3 Hrs.
*(vi)	Discrete Multivariate and Graph Theory	100	3 Hrs.

(* syllabus will be framed later on)

Paper-IV Seminars 100

Dissertation : (Including viva-voce)

(As per decision of the University, in Disertation instead of marks, grading system is being followed).

Paper-I : Stochastic Processes Max. Marks : 100
Time : 3 hrs.

Section-I (Three Questions)

General Stochastic processes, definition, classification and examples, Markov chains, higher transition probabilities. Classification of states and chain, determination of higher transiti on probabilities. Stability of Markov systems limiting behaviour. Markov chain with continuous time.

Probability generating functions. Compound distributions Branching process, extinction probabilities, total progency.

Section II (Two Questions)

Poisson process and related distributions, generalizations of Poisson process. Birth-death processes. Markov process with discrete state space. Application of Stochastic Process in Epidemics.

Renewal process, ordinary, modified and equilibrium, time upto rth renewal, distribution of the number of renewals, renewal function, renewal density, backward and forward recurrence times.

Section-III (Three Questions)

Markov process with continuous state space. Brownian motion. Wiener process. Diffusion equation. Fokker-Flank equation, distribution of the first passage time.

Stochastic Processes in queues, general concepts, waiting time distribution and transition solution of M/M/1. Steady state solutions of M/M/1/R, M/M/s M/M/s/s models. Bulk queues. Non-Markovian queues. Imbedded Markov chain technique, limiting probabilities of M/G/1, $M/G^{a,b}/1$ and GI/M/1 models Supplementary variable variable technique, M/G/1, $M/G^{a,b}/1$ models.

Section-IV (Two Questions)

General introduction to Reliability theory. Reliability models. Series, parallel and mixed mode failure systems. Redundant system. Standby redundancy, Redundancy optimization. Maintainability and availability functions. Two unit parallel system with repair. Preventive maintenance.

Exponential, Gamma, Weibull, Normal and Log-normal distributions (two parameters and three parameters cases). Estimation of their parameters with complete, truncated and censored samples. Estimation by components of order statics : K out of n. Reliability estimation.

Books Recommended :

1. Bailey, N.T.J. : Elements of Stochastic Processes.
2. Balaguruswamy, E. : Reliability Engineering.
3. Cox, D.R. and Miller H.D. : The Theory of Stochastic Processes.
4. Kashyap, B.R.K. and Chaudhary, M.L. : An Introduction to Queueing Theory.
5. Medhi, J. : Stochastic Processes.
6. Sinha, S.K. : Reliability and Life Testing (Ch I to III).

Note : The question paper will consist of **ten** questions as indicated. The candidates will be required to attempt **five** questions selecting atleast **one** question from each section.

Paper-II & III Opt. (i) : Demography and Advanced Theory of Sample Surveys

Max. Marks : 100
Time : 3 hrs.

Section-I (Theory Questions)

Demography and its interdisciplinary nature, source of demographic data-their errors and biases. Adjustment for age data-use of Waipple's Myer's and UN indices. Graduation of rates and ratios by summation formulae and graphical methods. Construction of abridged life tables and their used. Measurement of population growth, reproduction rates and their refinements, Lotka's, model (deterministic) and intrinsic rate of growth, use of Joslie matrix, growth curves and methods of their fitting, population projections and their estimates-component method of using mathematical curves.

Section-II (Three Questions)

Types of sampling : simple random, stratified random and systematic sampling. Estimation of Mean, Variance and Proportion in simple random and stratified random sampling. Optimum allocation. PPS sampling with equal and unequal probabilities. Estimation of Mean and Variance in systematic san pling. Com. parison of simple random, stratified random and systematic sampling. Estimation in Ratio and Regression estimators.

Section-III (Two Questions)

Single-stage cluster sampling. Multistage sampling. Selection of psu's wiih unequal probabilities. Selection of psu's with replacement, stratified multistage sampling. Estimation of ratios. Choice of sampling and sub-sampling fractions. Some useful multistage designs.

Double sampling for difference estimation, PPs estimation biased and unbiased ratio estimation, regression estimation and stratification Repetitive surveys. Sampling on more than two occasions.

Section IV (Two Questions)

Non-Sampling errors. Response errors. Response bias. The analysis of data. Estimation of variance components. Uncorrelated response errors. Response and sampling variance. The problem of Non-response. Some examples of sources of error.

Variance estimation, estimation for sub-population. The best linear estimator. Two-way stratification with small samples. Variance Estimation in Multistage sampling. Sampling inspection.

Books Suggested

1. Cochran, W.G. : Sampling Techniques.
2. Cox, P.R. : Demography
3. Des Raj : Sampling Theory
4. Keyfitz, N. : Applied Mathematical Demography.
5. Pollard, J.H. : Mathematical models for the growth of human populations.

6. Srivastava, O.S. : A Test Book of Demography.

7. Singh, D. & Chaudhary, F.S. : Theory and Analysis of Sample Survey Designs.

NOTE :— The question paper will consist of **ten** questions as indicated. The candidates will be required to attempt **five** questions selecting atleast one question from each section.

Paper-II & III Opt. (ii) : **Non Parametric Inference and Statistical Genetics**

Max. Marks : 100
Time : 3 Hrs.

Section-I (Two Questions)

Order statistics, their distributions and properties. Distribution of functions of order statistics : sample quantiles, range and coverage. Asymptotic distributions. Bahadur's representation (statement only) and its use in proving joint normality of two or more quantiles. Brief discussion of three possible limiting distributions of maxima and minima of observations.

Section-II (Four Questions)

Rank order statistics, correlation between variate values and ranks. Linear rank statistics, its applications, property and usefulness in inference problems. Asymptotic distribution of linear rank statistics (statement of Hajeki's theorem) Pitman asymptotic relative efficiency.

Non-parametric estimation, sufficient statistics for Non- parametric families, estimation of regular functionals, U-statistics its property and asymptotic distributions (in one and two sample case).

Empirical distributions function, confidence interval based on order statistics for quantiles, tolerance regions, confidence

Tests similar for Non-parametric hypothesis, rank tests, MP, UMP, and LMP rank tests. Tests for two sample location and scale problems, tests for C-sample problem.

Section-III (Two Questions)

Basic terms and definitions in genetics, concept of gene frequencies. estimation of gene frequencies. Random mating populations. Inbreeding. The generation matrix theory of inbreeding. Seggregation and linkage estimation of seggregation and linkage parameters.

Section-IV (Two Questions)

Quantitative inheritance, genetic parameters heritability, genetic correlation and repeatability method of estimation, selection and its effect, selection index, dialled and partially dialled crosses.

Books Suggested

1. David, H.A. ; Order statistics, 2nd Edition.
2. Fraser, D.A.S. : Non-Parametric Methods in Statistics.
3. Gibbons, J.D. : Non-Parametric Methods in Statistics, 2nd Edition.
4. Kampthrone, O. : An Introduction to Genetic Statistics.
5. Kendall, M.G. and Stuart, A. : Advanced Theory of Statistics, Vol. I & II.
6. Randles, R.H. & Wolfe, D.A. : Introduction to the Theory of Non-Parametric Statistics.
7. Prem Narain : Statistical Genetics.

Note :-The question paper will consist of **ten** questions as indicated. The candidates will be required to attempt **five** questions selecting atleast **one** question from each section.