Syllabus of Research Methodology for M.Phil. Entrance Examination- 2018-19
(As per revised Ordinance No. 13 for M.Phil. Course)

Note: 1-In the light of above ordinance, the syllabus for M.Phil. Entrance Examination 2018-19 in different subjects as appoved by respective Board of studies are as under-

2-The question paper shall comprise of 50 objective type compulsory questions and shall carry 1 mark each.

Subject-Physics
Part-A

Concepts in Research- Definition and Objective.

Research Approach and types of Research.

Selection of Research problem.

Representation of data- Tabular and Graphical form.

Statistical Analysis of data- Mean, Median, Mode.

Fourier Analysis and applications.

Curve fitting of straight lines.

General idea of Mathematical Modelling and Simulation.

Newton Raphson Method.

Concept in Material Science- Macro to nano materials.

Preparation methods of nano materials, Crystal growth techniques.

Basic Principles and applications of X - Ray Diffraction.

Space Research observation- Ground and Satellite observation.

Particle Detectors.

Optical and radio telescopic techniques.

Subject-Chemistry
Part-A

Simple mathematics

Equations for straight line. Parabola, hyperbola, ellipse, Solution for roots, differentiation, Integration, different formula for log, antilog

Use of computers:

Basic computers, Memory, saving of files, operations

Variables, Dependent and independent, Chart preparation, power point

Errors, precision, standard error of estimation, significant figures, Sampling techniques, sample analysis, simple statistics, central tendency. Mean, mode, median, Correlation, different types of tests, use of MS word in preparation of charts, diagrams etc.

Topics Overview of Research:

• Meaning, purpose, significance of ethical conduct in research, Classification of Research based on its purpose (Basic, Applied, Evaluation and Action Research)

Scientific Thinking:

• Types of reasoning, Critical Thinking, Importance of existing knowledgebase (research literature)

Basic Chemistry:

Instrumentaion:

Laws of electromagnetic radiations- Beer Lamberts law,

Principle and techniques of UV, Visible and Infra red spectroscopy,

Voltametry and polarographic analysis., resonance techniques NMR, ESR

Nomencleature in IUPAC system,

Name reactions

Subject-Mathemetics
Part-A

Research Aptitude: Research: Meaning, characteristics and types; Steps of research; Methods of research; Research Ethics; Paper, article, workshop, seminar, conference and symposium; Thesis writing: its characteristics and format.

Reasoning (Including Mathematical): Number series: Letter series; Codes; Relationships; Classification.

Logical Reasoning: Understanding the structure of arguments; Evaluating and distinguishing deductive and inductive reasoning; Verbal analogies: Word analogy-applied analogy; Verbal classification; Reasoning logical diagrams: Simple diagrammatic relationship, multi-diagrammatic relationship; Venn diagram: Analytical reasoning.

Data Interpretation: Sources, acquisition and interpretation of data; Quantitative and qualitative data; Graphical representation and mapping of data.

Information and Communication Technology: ICT: Meaning, advantages, disadvantages and uses; General abbreviations and technology; Basic of internet and e-mailing.

Subject-Computer Science
Part-A

Introduction: Evolution of Scientific Inquiry, Concept in Research, Definition and objective. Scientific Research Approach, Type of research, Selection of research problem, Formulating the Objective, Research Design.

Data Collection and Analysis: Source of Data– Primary Secondary & Tertiary, Type of data– categorical, nominal and ordinal.

Methods of Collection of data: Observation, Field investigation direct studies– reports, records or experimental observations.

Sampling methods– Data Processing and Analysis strategies, Descriptive Analysis, Inferential Analysis, Correlation analysis, Least square method, Data Analysis using statistical package, Hypothesis, testing, Generalization and Interpretation, Modelling.

Representation of data– Tabular and graphical form. Statistical Analysis of data– Mean, Median, Mode. Fourier analysis and application, curve fitting of straight lines.

General idea of Mathematical Modelling and simulation, Newton Raphson Method.

Subject-Environmental Biology/Biotechnology/Microbiology/Environmental Sc./Biochemistry
Part-A

Unit-I

* Meaning ,objectives and types of research Basic Primarily of experimental design.Interpretation and Report Writing.

* Science of sampling, need of sampling,sample size and its determination. Random and non-random sampling.

* Plant and Animal sampling,Community analysis, IVI, Indices of species diversity, Richness and Similarity index.

Unit-II

* Analytical methods: Micrometry, gravimetry, chromatography, electrophoresis, HPLC, GLC.

* Spectroscopic technique of Analysis, Spectrophotometer- single and double beam. Atomic Absorption Spectrophotometer, Flame photometer.

* Air Pollution monitoring, technique, Gaseous and particulate sampling. High Volume air sampler. Respirable dust sampler. Water sampling technique, Water quality analysis.

* Estimation of productivity- primary and secondary productivity.

Unit-III

* Microbial culture sterilization techniques Culture media-types and preparation, colony counting techniques.

* Identification and enumeration of microorganisms, Preservation and storage and maintenance of microorganism.

* Determination of MPN, confirmatory tests.

* Microscopic study of blood cells, cell organells, spores etc.

Unit - IV

* Basic elements and tools of statistical analysis, Measures of central tendencies-mean ,mode,median, standard deviation, Planning and execution of survey, Test of significance, students 't' test, chi square test, correlation and regression analysis. Probability distribution, Analysis of variance-one and two way classification.

Unit - V

* History and development of Computers. Hierarchy of Computers.

* Computer hardware ,Components and functional structure.

* Computer softwares- MS Windows, MS office 2003-07/XP including , MS word, MS Excel, MS Powerpoint.

* Designing of document and file handling. Database management.

* Basic idea of Internet, E-mail.

Subject-Botany
Part-A

I - Scope & significance of Research, Historical review. Biological problems and assumption, Search of research problem, Reference and literature search, Records and presentation of data, Research papers, Abstracts and other literature, Rules for maintaining Biosafety in the laboratory.

- II Instrumentation - Principle and Application: Research microscope, Autoclave, Hot Air oven, Laminar flow, calorimeter, pH meter, Soxhelt, BOD, centrifuge, electrophoresis, Electronic balance chromatography, Spectrophotometer, Microtome, Cryotomy staining Microphotography, Air Sampler.

III- Methods of sterilization (dry heat, wet heat gradiation, chemical & filteration etc.). Technique of plant tissue culture, Field survey, plant collection and identification key preparation, conservation technique for plant material, Bio-chemical & phytochemical technique, Soil & Water Analysis.

IV - Biostatistics - Mean, Median, Mode, Histogram, Frequency Curve, Frequency Polygons, Standard Deviation & Standard Error, Analysis of variance, Bio-nominal Distribution, Test of Significance (t-test, chi-square Test, Probability, ANOVA Basics of correlation and regretion analysis.

V Computer Application

Introduction to computer fundamental (MS Word, Powerpoint, Excel,) Application of computer in bio-statistical problem, Bological Data Type, Classification of biological data base sequence, data base, gene bank swiss-proy, Protein sequence data base, Bio-informatics:- Definition, role and limitation.

Subject-AIHC & Archaeology
Part-A

A   **Methodology.**

1   Fundamentals of Research its importance and scope.

2   Identification and formulation of problems and hypotheses.

3   Documentation (footnotes, Backnotes, Bibliographical references and diacritical marks) quotations and citations.

4   Data collectin, Library work, manucripts, Museum, Field Survey, Expolation and Excavated materials.

5   Thesis Writting.

B.   **Sources and Ancient Indian History Culture and Archaeology.**

1.   Literary Sources : Vedic Literature, Dharma-Sastra, Astadhyayi, Mahabhashya of Patanjali, Buddhist and Jain Literature.

2.   Historial Literature : Epics and the Pranas, Arthasastra, Harsacharit, Rajaaranini, Accounts of the Foreigner.

3.   Insciptions and Coins.

4.   Archaeological method of deermining the chronology and dating the findings : Sculptures and Monuments.

Subject-Business Economics
Part-A

1. Social Research - Nature and Techniques, Logical, Historical and Scientific Methods in Social Sciences.

2. Problem formulation, Research Design and Project Formulation, Hypothesis: concepts, selection of Universe, sampling. Methods of Data Collection - Primary and Secondary

3. Techniques of Data Collection - Content Analysis. Interview, Observation, Schedule and Questionnaire. Characteristics of a good Researcher.

4. Techniques of Measurement Analysis - Index Number.

5. Data Processing - Editing, Coding, Sorting and Computing Variables, Classification and Tabulation.

6. Report Writing - Introduction, Research Methods, Referencing and Foot Noting, Analysis and Interpretation, Presentation of Conclusion, Presentation of Tables and Diagrams, Statistical Tests- Chi-square Test, t-Test, z-Test, ANOVA and F-distribution.

7. Frequency Distribution - Frequency, Tables, Rules of Frequency arrangement, Distribution of comparative frequency and cumulative frequency.

8. Graphic & Diagrammatic Presentation of Data.

Subject-English
Part-A

*Basic Concepts of Research Methodology and Documentation

*A Brief History of English Literature

*Major Literary Movements and Ages

*Major Literary Theories

*A Brief History of Indian Writing in English/ American Literature

Subject-Hindi
Part-A

इकाई :- ०१ : शोध प्रविधि -

शोध प्रविधियाँ और उनका परिचय, विविध क्षेत्रों की शोध प्रविधियाँ, समाज विज्ञान, मानविकी और विज्ञान की शोध प्रविधियों का परिचय तथा उनकी तुलना।

इकाई :- ०२ : शोध के विविध रूप -

शोध का अर्थ, विस्तार, अवधारणा, शोध के पर्याय, अर्थ भेद, अनुसंधान के तत्व, अनुसंधान का प्रयोजन, हिन्दी अनुसंधान का विकास, साहित्यिक अनुसंधान की विशेषताऐं।

इकाई :- ०३ : अनुसंधान की पद्धति -

ऐतिहासिक, तुलनात्मक, भाषा वैज्ञानिक, साहित्यशास्त्रीय, समाजशास्त्रीय, पाठालोचन, सर्वेक्षण, साक्षात्कार।

इकाई :- ०४ : शोध प्रबंध लेखन -

शोध लेखन की व्यावहारिक समस्यायें, विषय चयन, सामग्री संकलन, लघुशोध और शोध प्रबंध में अंतर, शोधार्थी और निर्देशक की योग्यता, शोध प्रबंध की भूमिका, उपसंहार, मानक आधार एवं संदर्भ ग्रंथ सूची, प्रादर्श, अनुक्रमणिका।

इकाई :- ०७ : कम्प्यूटर और उसकी कार्यप्रणाली -

कम्प्यूटर क्या है? कम्प्यूटर के अंग, अंगों के कार्य, कम्प्यूटर की उपयोगिता, कम्प्यूटर का ज्ञान–विज्ञान के क्षेत्र और विविध क्षेत्रों में महत्व, कम्प्यूटर की भाषा, कम्प्यूटर और इंटरनेट, कम्प्यूटर का भविष्य और लाभ–हानि।

Subject-Tribal Study
Part-A

इकाई :- ०१ : सामाजिक अनुसंधान की विधियाँ

इकाई :- ०२ : योजना एवं सांख्यिकी

इकाई :- ०३ : प्राथमिक एवं द्वितीयक डाटा

इकाई :- ०४ : जनजातीय सांख्यिकी

इकाई :- ०७ : मीन मीडियम मोड

इकाई :- ०६ : प्राथमिक सांख्यिकी का सिद्धान्त

Subject-Social Work
Part-A

Unit I

Nature of Science and Scientific Method, Social work Research: Meaning, Purposes, Process and Scope.

Research Problem, Hypothesis- Formulation & Functions, Attributes of a good Hypothesis

Unit II

Types of Research-Experimental Research, Case study, Ex-post-facto Research, Survey Research

Unit III

Research Designs – Between Group, Factorial and Within Group Design, Sources of Data-Primary and Secondary Sources; Technique of Data Collection; Observations, Interview, Questionnaire, Tests and Scales

Unit IV

Sampling – Meaning Characteristics, types and purpose. General considerations in the determination of sample size

Purpose of statistics, Measurement scales-Nominal, Ordinal, Interval and Ratio Scales.

Unit V

Frequency distribution and Graphic representation of data, Measures of Central tendency-Mean, Median and Mode Measures of variability-Range, Quartile deviation, Mean deviation and Standard deviation.

Correlation-Persons 'r' Spearman' Rho. Chi-Square and the 't' test.

Subject-Psychology
Part-A

Unit I

Nature of Research, Meaning, Purposes, Process and Scope. The scientific approach, Research Problem, Hypothesis, Variable and there Types.

Unit II

Techniques of data collection, Observation, Questionnaire, Interview, Content Analysis.

Sampling: Meaning, Types and methods of sampling, sampling errors, Null Hypothesis, Type I and Type II Error, Level of significance.

Unit III

Experimental Design: Introduction, Between Group Design, Within Group Design, Factorial Design, Randomized Block Design, Latin Square Design, Time Series Design.

Unit IV

Measures of Central tendency, Measures of variability, Correlation: Product moment method (grouped and ungrouped data), Biserial and tetrachoric correlation, Partial Correlation, Significant Difference between Means.

Unit V

ANOVA Test. One Way and Two Way Analysis of Variance Test.

Non Parametric Tests: Chi Square Test and Its Types. Sign Test, Median Test, Mann-Whitney-U-Test

Subject-Tourism Administration
Part-A

1   Introduction : Research: Meaning – significance – [urpose – types – scientific research – steps in research, Identification, selection and formulation of reserch problems, research questions – research design – hypothesis formulation.

2   Data Collection : Data for research : Primary data – meaning, collection methods – observation – Interview – questionaire – schedule.

3   Sampling : Meaning sampling theory – types of sampling – steps in sampling – sampling design – sample size – samling techniques and methods – samling and non-sampling errors – advantages and limitations of sampling.

4   Data Analysis : Data processing edition – Coding – Trascrition and tabulation – Measures of entral Tendency and variance. Data Analysis – Meaning and Methods – Quantitative and Quantitative Analysis – an overview of parametric and non-parametric tests – application of advanced software packages.

5   Report Writing : Research Report : Types of Report – Stucturing the Report– Contents – Styles of Reporting – Steps in Drafting Reports – Editing and Evaluating the Final Draft Report.

Subject-Physical Education
Part-A

1. Definition of Research, Need and importance of Research in Physical Education and Sports, Classification of Research, Criteria of selection of good Research problem.

2. Introduction of Research, fundamental, applied and action research, meaning and importance, Types of hypothesis.

3. Methods of Research historical, descriptive, experimental and philosophical.

4. Concept of population and sample methods of sampling.

5. Research tools - Data Collection, Questionnaire, interview, observation, Psychological Test.

6. Introduction and fundamental of computer, Hardware, Software, output, Input storage devices, computer networks, Internet, search Engines, MS Office, MS word, MS excel, Power Point, preparation of slide E-learning.

7. Method of writing, thesis/dissertation.

8. Function, need and importance of statistics in physical education.

9. Meaning, Purpose, Calculation and advantage of prcentile scale Z- scale and T-scale.

10. Principle of normal curve, Skewness and Kurtosis.

Subject-Business Administration
Part-A

PART –A: Research Methodology

Meaning, Objectives, Significance,Importance and Scope of Research in Management, Review of Literature.Research Design and its types,Features of a Good Research Design,Types of research, Sampling Design,Measurement &Scaling Techniques, Hypothesis; Meaning and its Formulation. Source of Data, Collection of Primary Data,Processing of Data: Editing, Coding&Classification, Field Work and Tabulation of Data.Analysis of Data,Utility and Importance of Statistics

in Research, Measures of Central Tendencyand Dispersion, Correlation and Regression, Statistical Tests such as Z-test; T-test; F-test; Chi- Square test; ANOVA.Interpretation and Report Writing: Technique and Precautions in Interpretation, Steps in Report Writing; Layout of the Research Report; Basics of MS-Office- Word, PowerPoint and Excel; Research Related Software Like SPSS and others.

Subject-Commerce
Part-A

1. Social Research - Nature and Techniques, Logical, Historical and Scientific Methods in Social Sciences.

2. Problem formulation, Research Design and Project Formulation, Hypothesis: concepts, selection of Universe, sampling. Methods of Data Collection - Primary and Secondary

3. Techniques of Data Collection - Content Analysis. Interview, Observation, Schedule and Questionnaire. Characteristics of a good Researcher.

4. Techniques of Measurement Analysis - Index Number.

5. Data Processing - Editing, Coding, Sorting and Computing Variables, Classification and Tabulation.

6. Report Writing - Introduction, Research Methods, Referencing and Foot Noting, Analysis and Interpretation, Presentation of Conclusion, Presentation of Tables and Diagrams, Statistical Tests- Chi-square Test, t-Test, z-Test, ANOVA and F-distribution.

7. Frequency Distribution - Frequency, Tables, Rules of Frequency arrangement, Distribution of comparative frequency and cumulative frequency.

8. Graphic & Diagrammatic Presentation of Data.

Subject-Policy Research
Part-A

इकाई I.
सामाजिक अनुसंधान – अर्थ, परिभाषा क्षेत्र महत्व
सामाजिक अनुसंधान के आधार – तार्किक, एतिहासिक तथा वैज्ञानिक पद्धति
सामाजिक अनुसंधान के प्रमुख चरण
सामाजिक अनुसंधानकर्त्ता के आवश्यक गुण

इकाई II.
सामाजिक सर्वेक्षण – अर्थ, परिभाषा, प्रकृति, उद्देश्य
सामाजिक सर्वेक्षण का आयोजन एवं प्रमुख चरण
उपकल्पना – अर्थ, परिभाषा, विशेषताएं एवं महत्व
अनुसंधान प्ररचनाएं – अर्थ, प्रकार
निर्देशन – अर्थ, प्रकार एवं समस्याएं

इकाई III.
तथ्यों के स्रोत – प्राथमिक एवं द्वितीयक स्रोत
समंकों के संकलन की प्रविधियां–निरीक्षण, साक्षात्कार, अनुसूची, प्रश्नावली, वैयक्तिक अध्ययन
अनुमापन प्रविधियां– अर्थ, प्रकार एवं उपयोग,
प्रक्षेपी प्रविधियां, अर्थ, विशेषताएं, एवं प्रमुख विधियां

इकाई IV.
तथ्यों का संपादन, संकेतन, वर्गीकरण एवं सारणीयन
समंकों का विश्लेषण एवं व्याख्या
समंकों का चित्रभय एवं बिन्दुरेखीय प्रदर्शन,
प्रतिवेदन लेखन

इकाई V.
सांख्यिकी – अर्थ, परिभाषा, क्षेत्र एवं महत्व
केन्द्रीय प्रवृत्ति की माप – माध्य, माध्यिका एवं बहुलक
मानक विचलन
सहसम्बन्ध – सह सम्बन्ध गुणांक