

Physics - 2020-21

THE M.Phil / Ph.D ENTRANCE TEST SYLLABUS

[As per M.Phil. Ordinance no.13 and Ph.D. Ordinance no.11]

The Test will have the question paper in **two parts A and B.**

The Syllabus for **Part A: Research Methodology [Common to all subjects of faculty of Science (i.e. 1. Physics 2. Mathematics 3. Statistics 4. Chemistry 5. Geology 6. Pharmacy)]**. 50x1=50

Part-A shall consist of **50 objective type** compulsory questions of 1 mark each based on **Research Methodology**. It shall be of generic nature, intended to assess the research aptitude of the candidate. It will primarily be designed to test reasoning ability, data interpretation and quantitative aptitude of the candidate.

H Singh
23/7/18

Rashid

Shahin

Sanjay K. G. N.

Raj

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THE M.Phil./Ph.D. ENTRANCE TEST SYLLABUS : 2020-21

Syllabus for Part-A: Research Methodology 50×1=50

[Common to all subjects of faculty of Science (i.e.1. Physics 2. Mathematics 3. Statistics 4. Chemistry 5. Geology 6. Pharmacy)].

- Meaning of research, Objective of research, Types of research, Research approaches, Significance of research, Research methods versus research methodology, Research process, Criteria of good research.
- Research Problem, Selecting the problem, Necessity of defining the problem, Technique involved in defining problem.
- Meaning of Research Design, Need for Research Design, Feature of good Design, Important Concepts Relating to Research Design: Dependent and Independent variables, Extraneous Variable, Control, Confounded Relationship, Research Hypothesis, Experimental and Non-Experimental Hypothesis, Experimental and Control Groups, Treatments, Experiment, Experimental unit (s), Research Designs in Case of Exploratory Research Studies, Descriptive and Diagnostic Research Studies.
- Quantitative and Qualitative data, Classification of Measurement Scales: Nominal Scale, Ordinal Scale, Interval Scale, Ratio Scale. Goodness of Measurement Scale: Validity, Reliability and Practicality.
- Types of data: Primary and Secondary, Methods of Collecting Primary data: Observation method, Interview method, Collection of data through questionnaires, Collection of data through schedules, Difference between questionnaires and schedule, Collection of secondary data.
- Classification of data, Tabulation, Diagrammatic and Graphical representation of data: Bar chart, Pie chart, Box plot, Histogram, Frequency polygon, Frequency Curve, Ogive.

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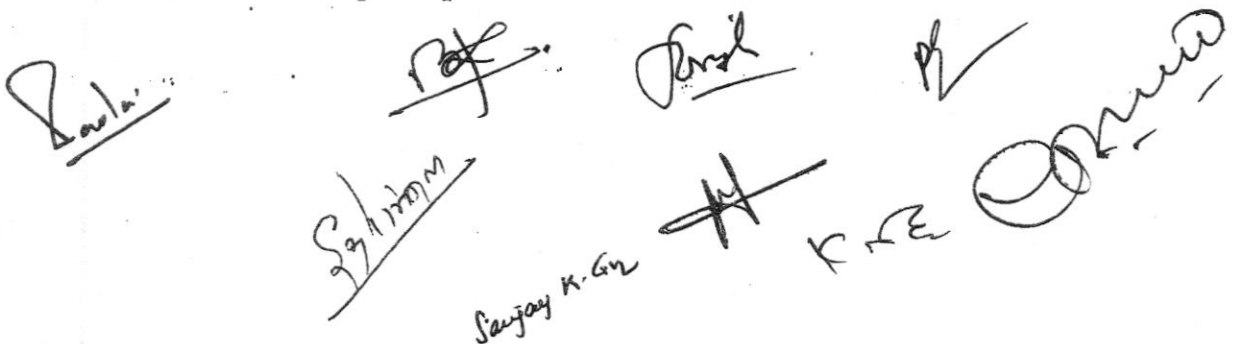
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- Measure of Central Tendencies: Mean, Median, Mode .
Measures of Variability: Range, Quartile Deviation, Standard Deviation and Coefficient of variation.
- Meaning of Correlation, Scatter diagram, Karl Pearson Coefficient of Correlation, Rank Correlation, Regression lines, Regression coefficients, Properties of regression coefficient. Normal Distribution and its Properties
- Testing of Hypothesis and Test of significance: Null and Alternative Hypothesis, Type I and Type II errors, Critical region, Level of significance, One-Tailed and Two- Tailed Tests, Large sample tests: Test of significance for single proportion, Difference of proportions, Single mean and difference of means, Chi -Square test of goodness of fit and independence of attributes. Small sample tests: t-test for single mean, t-test for difference between two sample means, Paired t-test for difference of means, F-test for equality of population variances.
- Analysis of Variance.
- Computer languages and Operating System(OS)-Assembly language, Machine language, MS-DOS and Windows.
- MS-Word and Power point presentation.


 A collection of handwritten signatures and initials in black ink. From left to right, there is a signature that appears to be 'Sankar', a signature 'S. K. M.', a signature 'Sankar', a checkmark, a signature 'Sankar', a signature 'Sankar', and a signature 'Sankar'. Below the 'S. K. M.' signature, the name 'Sankar K. G.' is written.