

GANPAT UNIVERSITY

Syllabus for the Ph. D. Entrance Examination

Instructions:

1. The question paper of the Ph. D. Entrance Examination shall be of 100 marks, to be attempted in 2 hours duration.
2. The question paper will have 2 sections (Section-A and Section-B).
3. Section-A (From Research Methodology) will consist of 50 objective type questions (Multiple Choice), each carrying one mark. Section A shall be common for all the candidates appear in Entrance Examination.
4. Section-B shall be of 50 marks which is Subject specific depends on respective discipline/branch) will consist two parts.
 - Part - I shall be of 25 marks having 25 objective type of questions with multiple choice answers having only one correct answer.
 - Part - II shall be of 25 marks and having descriptive type of questions.
5. There is no negative marking.

SECTION – A

(Common for all candidates)

RESEARCH METHODOLOGY

Total Marks: 50

Unit	Content	Marks
1	Basics of Research: Research: Meaning, Objective, Characteristics, Steps of research, Methods of research, Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.	[05]
2	Research Problem and Research Design Introduction to Research Problem, Necessity of Defining the Problem, Selecting the Problem, Techniques Involved in Defining a Problem, Meaning and Types of Research Design, Important Concepts Relating to Research Design	[10]
3	Data Collection and Analysis Methods of Data Collection- Observation, Interview, Questionnaires, Schedules, Survey and Experimental. Selection of Appropriate Method for Data Collection, Different Techniques of Sampling such as Probability and Non-Probability, Basic Statistical Methods of Data Analysis such as Frequency distribution, Measures of central tendency, Measures of Dispersion, Coefficient of variation, correlation and regression.	[20]
4	Ethics in Research: Environmental impacts and Ethical issues, Commercialisation, Copy right, Royalty, Intellectual property rights and Patent law, Plagiarism, Citation, Referencing style and acknowledgement.	[05]

Reference Books

1. 'Research Methodology- A Step-By-Step Guide for Beginners', Ranjit Kumar, (Pearson Education, Delhi) ISBN: 81-317-0496-3.
2. 'Research Methodology- Methods and Techniques', Kothari, C.K., New Age International, New Delhi.
3. Research In Education, John V. Best, John V. Kahn 10th ed., Allyn & Bacon Publisher, 2005.
4. Practical Introduction of copyright by Gavin Mcfarlane, McGraw Hill Inc., USA.
5. Introduction to Scientology Ethics, Hubbard, L. Ron. New Era Publisher, Denmark.
6. Research Methodology by Deepak Chawala, Vikas Publications.
7. Statistics for Management, Levin & Rubin, Pearson Publication

SECTION – B

Faculty of Engineering & Technology

[Electrical Engineering]

Unit	Content	Marks
1	Electrical Network: Basic Laws, Network Theorms, Nodal Mess Analysis, Laplace transform. Fourier Transform, Two Port and Multi port network. Basics of Z, Y & H parameters.	[8]
2	Electrical Machines & Power Electronics: Basic principle, Various types, Starting methods, Input and Output characteristics of DC Machines and its applications. Basic principle, Various types, Starting methods, Input and Output characteristics of 1-phase and 3-phase AC asynchronous Machines and its applications. Types of transformers, Working, Testing and Parallel operations of transformer, Special transformers (Auto, CT, PT). Basic principle, Various types, Starting methods, Input and Output characteristics of 3-phase Synchronous Machines and its applications. Power Electronics devices, Controlled rectifiers, Uninterrupted power supplies, Various inverters, Choppers, Line commutated converters, Multi level Inverters, Electrical drives, Electrical traction, Heating and Welding, Illumination.	[17]
3	Measurement & Instrumentation: Various DC and AC bridges, Potentiometers, Moving Coil and Moving iron meters, digital meters, Various types of Transducers to measure physical quantities.	[5]
4	Microprocessor & Microcontroller with all interfacing device:	[5]
5	Power System Analysis, Operation and Control: Power System Modeling, Fault analysis, Load flow Analysis, Stability of single and multi machine systems, Autometric Generation control, Economic operation, State Estimation, Power System Security. Various software to simulate power systems.	[5]
6	Swichgear and Protections: Isolators, Arc quenching methods, Various types of Circuit breakers, Testing of Circuit Breakers, design of sub stations and transmission lines, Various types of Cables.	[5]
7	Recent trends in Power System: HVDC systems, Facts Controllers, Distributed Generation, Smart Grids, Integration of Renewable power plants, Topics from research papers published in last 5 years. NOTES: Some basic topics from Electrical, Analog Electronics, Digital Electronics and control system is not included but indirectly covered in advance topics of power system.	[5]