BHARATI VIDYAPEETH UNIVERSITY, PUNE

PhD Entrance Test – 2017

Syllabus

SECTION-I: Research Methodology

∗The syllabus of Research Methodology will be common for all the subject except Law

Syllabus	
Introduction to Research : The concept of research, characteristics of good research, Application of Research, Meaning and sources of Research problem, characteristics of good Research problem, Research process, outcomes, application of Research, Meaning and types of Research hypothesis, Importance of Review of Literature, Organizing the Review of Literature.	
Types of Research : Types of research, pure (basic, fundamental) and applied research, qualitative and quantitative.	
Research Design : Meaning, need, types of research design – Exploratory, Descriptive, Casual research Design, Components of research design, and Features of good Research design. Experiments, surveys and case study Research design.	
Sampling, Data Collection and analysis : Types and sources of data – Primary and secondary, Methods of collecting data, Concept of sampling and sampling methods – sampling frame, sample, characteristics of good sample, simple random sampling, purposive sampling, convenience sampling, snowball sampling, classification and tabulation of data, graphical representation of data, graphs and charts – Histograms, frequency polygon and frequency curves, bell shaped curve and its properties. Statistical Methods for Data Analysis : Applications of Statistics in Research, measures of central tendency and dispersion	
Research Report : Research report and its structure, journal articles – Components of journal article. Explanation of various components. Structure of an abstract and keywords. Thesis and dissertations . components of thesis and dissertations. Referencing styles and bibliography.	
Ethics in Research - Plagiarism - Definition, different forms, consequences, unintentional plagiarism, copyright infringement, collaborative work. Qualities of good Researcher.	

ICT Tools for Research : Role of computers in research, maintenance of data using software such as Mendeley, Endnote, Tabulation and graphical presentation of research data and software tools. **Web search** : Introduction to Internet, use of Internet and WWW, using search engines and advanced search tools.	

RECOMMENDED BOOKS

1	Donald Cooper and PS Schindler (2009)	Business Research Methods, 9th edition, Tata McGraw Hill.
2	Kothari C. R	Research Methodology
3	Uma Sekaran (2010)	Research Methods for Business, 4th edition, Wiley.
4	Ranjit Kumar (2009)	Research Methodology, 2nd edition, Pearson Education
5	Naresh Malhotra and S Dash (2009)	Marketing Research, 5th edition, Pearson Prentice Hall.
6	Michael V. P	Research Methodology.
7	Fred N. Kerlinger :	Foundations of Behavioral Research.

BHARATI VIDYAPEETH DEEMED UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
Ph. D. Entrance Test Syllabus

Specific Subject: Electrical Engineering

Topics covered	
UNIT-I	**Power Electronics applications in power systems:** Three phaseconverters, firing schemes of converters, Inverters in Renewable Energy sources, Multi level Inverters, Power electronics drives for motors : Chopper , Voltage Source Inverter and Current Source Inverter fed drives, Principle Arrangement of an HVDC Transmission, Harmonic Filters, AC Harmonic Filter, DC Harmonic Filter, Active Harmonic Filter, Control & Protection in HVDC.
UNIT-II	**Power System Stability:** Basic definitions, statement of the problem, elementary model, Swing equations, power angle equations, Natural frequencies of oscillations, and single-machine-infinite bus system-Equal area criterion-classical model of a multi machines systems.
UNIT-III	**Transmission line protection**: Distance Protection, Use of optical fibers for protection schemes. System grounding – ground faults and protection; Load shedding and frequency relaying; Out of step relaying; Re-closing and synchronizing, Adaptive relaying.
UNIT-IV	**Power Quality:**Introduction of the Power Quality (PQ) problem, Terms used in PQ: Voltage, Sag, Swell, Surges, Harmonics, over voltages, spikes, Voltage fluctuations, Transients, Interruption, overview of power quality phenomenon, Remedies to improve power quality, power quality monitoring, Long- short interruptions, Voltage sag – characterization – Single phase.Mitigation of Interruptions and Voltage Sags.
UNIT-V	**Control System:** Stability analysis tools in time domain and frequency domain: root locus ,Bode and Nyquist plot, Compensator design of linear system, Advanced PID controller design techniques, Stability analysis of discrete time systems, Controllability and Observability of Multi Input Multi Output systems (MIMO)using state variable techniques. Application of softwares, Simulink and CAD for control system design.

Text Books/References:

1.	Feedback Control of Dynamic Systems by G.F. Franklin, J.D. Powell and A. Emami-Naeini
2.	M. Powella& P. G. Murthy, "Transient Stability of Power Systems - Theory & Practice", John Wiley Publications.(1994).
3.	S. Sunil Rao, "Switch Gear & Protection", Khanna Publisher's, Delhi
4.	Power Electronic Circuits, Devices and Applications – M. H. Rashid – PHI.
5.	Fundamentals of Electrical Drives by GK Dubey, Narosa Publishers.
6.	Stafani et al , "Design of Feedback control Systems" – Oxford Press, 4th eddition.
7.	Angelo Baggini, "Hand book of power quality", wiley publications, 2008.