

## Ph.D. Entrance Examination: 2019-20

**Date:31-01-2019**

**Time: 10.00AM to 01.00 PM**

**Place: B.G. Nagara**

### Syllabus

The entrance exam will be conducted in two parts.

**Part I. Principles of Basic Research Methodology (40 marks).** This is common to all faculties viz Engineering, Medical, Pharmacy and Management Business Administration.

**Part II. Specialty paper (60 marks)**

#### Syllabus for Part I

1. Research Methodology: An Introduction
2. Defining the Research Problem
3. Research Design
4. Sampling Design
5. Measurement and Scaling Techniques
6. Methods of Data Collection
7. Processing, statistics and Analysis of Data
8. IPR – Invention and creativity
9. Sampling fundamentals
10. Interpretation and Report Writing
11. Principle and methods of fundamental research method, Literature drug and research problem survey, clinical research
12. Writing an article for a Scientific journal

## Syllabus for Part II

### PHARMACY SYLLABUS:

The specialty paper syllabus content ordinarily be equal to the syllabus and books prescribed for post-graduate course for that subject as per Regulations of Apex body and/ or the Adichunchanagiri University/ RGUHS/4<sup>th</sup> & 5<sup>th</sup> Pharma.D subjects.

### ENGINEERING SYLLABUS:

#### I. Civil Engineering syllabus

**Engineering mechanics:** System of Coplanar Forces, Centroids and Moment of Inertia, Friction, Kinematics of a particle, Kinematics of rigid bodies, Momentum and Energy principles,

**Strength of materials:** Simple Stresses and strains, Shear force and bending moment, Shear stresses in beams, Principal stresses and strains, Direct and bending stresses, Columns and struts, thin cylinders.

**Fluid Mechanics:** Fluid statics, pressure measurement, buoyancy & floatation, fluid kinematics, fluid dynamics, flow measurement, orifices, mouth pieces, notches, weirs, flow through pipes, dimensional analysis and models, laminar flow, turbulent flow in pipes, boundary layer theory, flow through channels, rapidly varied flow.

**Surveying:** Measurement of Horizontal distances, Chain surveying, Measurement of angles, Measurement of Elevations, Theodolite Surveying, Tacheometric Surveying, Curves.

**Theory of structures:** Fixed Beams, Continuous Beams, Moving Load, influence lines, Strain.

**Concrete Technology:** Cement, Aggregates, Water, Admixtures, Fresh Concrete, Properties of Hardened Concrete

**Geotechnical engineering:** Structure of soil, Three Phase System, Index Properties of soils, Classification of Soils, Soil Water and Effective stress principal, Permeability of soils, Consolidation, Compaction, Shear strength, Exploration and in situ soil measurements.

**Water resources engineering:** Hydrology, Precipitation, Infiltration, Evaporation and evapo-transpiration, Run-off, Hydrographs, Floods, Ground water hydrology, Irrigation.

#### **Environmental engineering:**

**Water supply engineering:** Introduction to Water Supply, Quality of Water, Sources of Water, Raw Water Conveyance, Treatment of Water, Distribution of Water

**Sanitary engineering:** Sewage and Sewerage, Sewer Design, Sewer Appurtenances, Sewer Pumping, Waste Water Characteristics, Sewage Treatment, Effluent Disposal.

#### II. Mechanical Engineering syllabus:

**Prime movers** - Classification of I. C Engines - 2 Stroke & 4 Stroke Petrol & Diesel Engines. Concept of Mechanical efficiency, BHP & IHP, Laws of 1st & 2nd Thermodynamics, zeroth Law, applications.

**Turbines**- Steam turbines, Gas turbines and Water turbines - Parts, classification and applications

**Refrigeration & Air-conditioning** – properties, COP, unit of Refrigeration, Refrigeration effect, Tonne Refrigeration, Ice making capacity. Types of refrigeration system.

**Manufacturing Process** - Part of a lathe, operation in a lathe. Types of Drilling Machine, operation a Drilling machine. Types of milling machines, operation on milling machines. Grinding machines, bonding materials, grinding terminology. Types of grinding machine, Soldering, brazing & welding classification & types. Lubrication & bearing types.

**Power transmission** -Belt drives, gear drives,

**Heat treatment of Metals**- Annealing, Normalizing, Hardening, Tempering, Carburizing, Cyaniding, Nitriding and Flame hardening, Iron-Carbon equilibrium diagram.

**Engineering Materials** – Ferrous and non-ferrous metals and their applications.

### **III. Electronics and Communications Engg. syllabus**

**Analog Circuits** – BJT and MOSFET, Diode Circuits, Amplifiers, op – Amp Applications.

**Network Theory** – Basic Concepts, Network Theorems, 2-Port Network parameters.

**Signals and Systems** – Continuous –time signals, Discrete-time signals & LTI Systems.

**Electrical Machines** AC & DC, Transformers.

**Simplification of Boolean Expressions** – Karnaugh maps combinational logic Design.

**Sequential logic circuits** – Flip flops & counters, shift Register

**Control Systems** - Transfer function, Frequency Response, Time response of second order control systems, nyquist criteria – Bode plots, phase & gain margins.

**Communication** – Analog communication, Digital Communication.

**Power Electronics** - Thyristor, Choppers & Inverters.

**Electromagnetics** – Electric & magnetic fields, max wells equations, Transmission lines.

**Microprocessors** – Architecture, operation, programming and interfacing.

**VLSI Circuits** – MOS Transistors, Fabrication, Scaling of MOS Circuits, FPGA Based Systems, Testing and Verifications.

**Transducers.**

### **IV. Computer Science & Engineering syllabus**

Discrete Mathematical Structures (Set Memory Fundamentals of Logic, Relations functions) Computer Organization (as per CSE 46 Syllabus)

Data Structures using C (Stack, recursion, Queues and lists, Trees, sorting, searching)

Operating systems (as per CS 52 Syllabus)

OOP with C++ (as per CSE 36 Syllabus)

DBMS (as per CS53 Syllabus)

Analysis & Design of Algorithms (as per CSE 43 Syllabus)

Object oriented Analysis & design (as per CS 72 Syllabus)

Software Engg. (Overview, Requirements Engg, Software Design, verification & Validation)

**MANAGEMENT STUDIES/BUSINESS ADMINISTRATION SYLLABUS**

**Economics:** Demand and Supply – Production and Cost decisions – Pricing (policies and strategies in different market structure) – Measurement of National Income – Fiscal and Monetary Policy – Economic Reforms since 1991 – Inflation and Deflation – Money and Capital market, Indian Financial markets and Regulatory Bodies, Reforms in Indian Financial Markets – FDI – Business cycles.

**Organizational Behaviour and Human Resource Management:** Personality – Learning Motivation- Emotions at workplace – Group Dynamics, Organizational Climate – Culture Change & Development – Leadership – Managing Conflicts – Organizational Development– Human Resource Development – HR Planning – Recruitment- Selection – Training and Development – Performance and Potential appraisals—Career and Succession Planning.

**Accounting & Financial Management:** Financial Accounts – Financial Statement Analysis and Ratio Analysis – Fund flow and cash flow Statements – Costing Budgetary Control. Goals of Financial Management – Capital budgeting – Capital Structure- Leverage – Cost of Capital, Working Capital Policy.

**Marketing:** Consumer Markets and Business Markets – Segmentation – targeting and Positioning – Marketing Mix 4P's – Product life cycle – Services Marketing: Additional Ps – Customer Relationship Management, Digital and Social Media Marketing – Brand Management – Retailing on the net.

**Strategy:** Strategic Management – Vision- Mission – Objectives- Environmental analysis – Strategy formulation – Corporate Level SBU Level – Functional Strategies – Strategy implementation.

Corporate Governance: Procedures and Principles, Governance Reforms in India – Business Ethics: Ethics and Management System; Ethical issues and Analysis in Management; Value based organizations; Personal framework for ethical choices; Ethical pressure on individual in organizations; Gender issues; Ecological consciousness; – Corporate Social Responsibility.

**International Business:** Modes of International Business – Liberalization – Globalization – Privatization – Entry Strategies and FDI in International Business – Internationalization process of multinational enterprises – Cross culture management – EXIM Policy – World Trade Organization.

**Entrepreneurship:** Entrepreneurship and the Entrepreneurial Mind-Set – Entrepreneurial Intentions and Corporate Entrepreneurship – Entrepreneurial Strategy: Generating and Exploiting New Entries – Creativity and the Business Idea – Identifying and Analyzing Domestic and International Opportunities – Intellectual Property and Other Legal Issues for the Entrepreneur – The Business Plan – The Marketing Plan – The Organizational Plan – The Financial Plan – Sources of Capital – Strategies for Growth and Managing the Implication of Growth – Qualities required for future Entrepreneurs.

**QUESTION PAPER PATTERN**

The Ph.D. entrance examination question paper pattern is as follows:

- (i) There will be 40% questions on Basics of Research Methodology and 60% questions on core subject covering mainly respective Masters course syllabus.
- (ii) Duration of the examination is 3 hours.
- (iii) Under research methodology, the candidate has to answer

20 questions out of 30 questions. Each question carries 1 mark =20

10 questions out of 15 questions. Each question carries 2 marks =20

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**Total =40**

- (iv) Under core subject, the candidate has to answer

20 questions out of 30 questions. Each question carries 1 mark =20

10 questions out of 15 questions. Each question carries 2 marks =20

05 questions out of 10 questions. Each question carries 4 marks =20

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**Total =60**

**Penalty for false and incorrect statements: -**

Where an applicant has furnished any false and incorrect statement in the application or where the affidavit filed by him or the certificate furnished by him contains any false or incorrect statement, the application shall be liable for rejection and his selection for admission to the Ph.D. course shall be cancelled after providing a reasonable opportunity to explain by the Entrance Test Committee.

**Malpractice:** Any candidate indulging in mal-practice of any sort shall be viewed seriously and punished and also is liable for criminal proceedings. The committee can make guidelines in this regard.

S/d

**Registrar**