SR University,Warangal

PhD Entrance Syllabus

Structure of the PhD Entrance Test (100 Marks)
Section A: Aptitude and Reasoning – Common to all candidates (50 Marks)
Section B: Subject/Domain (ECE)-Specific (50 Marks)

Section A: APTITUDE & REASONING (Common to ALL)

Unit–1: Verbal Reasoning

Navigating Directions and Mastering Distances, Blood Relations, Logical Puzzles and Problem Solving- Floor Based, Month and Year Based. Seating Arrangements - Circular, Linear, Decoding the Code- Letter Coding, Number Coding, Letter and Number Coding.

Unit-2: Number System

Mastering Quick Calculations, BODMAS Simplified, Exploring Numbers and Division Rule, Unit Digits Decoded, Unlocking Divisibility and Counting Zeroes, "Mastering LCM and HCF: Foundations of Factorization, Uncovering Factors, Exploring Remainders.

Unit-3: Arithmetic Ability-1

Percentages - Fraction, Decimal, Percentage Change, Concept of 'By' and 'To', Product Constancy, All About Averages, Profit & Loss Essentials, Articles, False Weight, and Discount Insights - Discount, Simple Interest: Calculations and Applications, Compound Interest: Calculations and Applications, Relationship between SI and CI.

Unit–4: Arithmetic Ability-2

Ratio, Proportion, Partnership, Problems on Ages, Time and Work - Concept of Efficiency, Smart Work with Time and work, Negative Work, Chain Rule, Pipes and Cisterns, Time, Speed & Distance, Problems based on Trains, Problems based on Boats and Streams.

Unit-5: Critical Reasoning

Analogy and Classification, Sequence and Series Logic, Syllogisms - Types of statements, Venn diagrams using statements, Method to solve problems Two Statements and Two Conclusions, EITHER-OR Conclusions, Four Statements and Two Conclusions.

DEPARTMENT OF ECE
School of Engineering
SR University, Warangal

Section: B **ECE Syllabus for Ph.D. Admission Eligibility Test** (any one domain)

Sl. No.	Research Area	Syllabus
1	**VLSI Design and Embedded System**	**Network Theory:** Analysis of networks with Theorems, transient and steady state analysis of RL,RC,RLC circuits **Solid state devices:** Basics of semiconductor physics, carrier transport in PN Junction, basics of BJT and MOS devices. **Analog circuits**: Circuits with MOSFETs and BJTs, OPAMP Circuits **Digital circuits:** Boolean algebra, design and analysis of combinational and sequential circuits, CMOS Inverter and CMOS logic circuits **VLSI Technology:** Basic semiconductor fabrication techniques for ICs

2	**Signal Processing**	**Signals and Systems**: Continuous time signals and systems, basic system properties. Continuous-time and discrete time Linear Time-invariant system. Fourier series representation of continuous-time periodic signals. The Fourier transform for periodic signals, Properties of the continuous-time Fourier transform. The Laplace transform for continuous-time signals and systems and properties of the Laplace transform. **Digital Signal Processing**: Discrete-time signals: sequences, discrete-time systems, Linear constant-coefficient difference equations, linear and circular convolution, and correlation. Z-transform, The inverse z-transform, Properties of the z-transform. Frequency domain representation of sampling, Reconstruction of a bandlimited signals from its samples. Discrete Fourier Transform (DFT), Properties of DFT, convolution using the DFT. Fast Fourier Transform, Design of digital filters, IIR and FIR filters. All-pass systems, Minimum phase systems
3	**Communications**	Signals and Systems, Fourier Series, and Fourier Transforms, Frequency Response, Sampling Theorem. Wireless Communications/ Networks, Antennas/RF/Microwave, Fiber-optics/Photonics,. Basic Analog and Digital Communication Systems (AM, FM, BPSK, QPSK, QAM, FSK, etc.). Transmission lines, waveguides, S-Parameters, Antenna basics, Maxwell equations, Boundary conditions, Plane wave propagation, Reflection and transmission of interface. Single mode and multimode fibers, Numerical aperture, Dispersion, Basic principles of light generation (LED, LASER) and detection (PIN photodiode, APD).

Note:

•Candidates may attempt questions from only one module of the three listed above, according to their preference for PhD admission. For example, if a candidate wishes to pursue a PhD in Design specialization, they should attempt questions only from Module 1.

•Candidates are not allowed to attempt questions from multiple sections.