GITAM SCHOOL OF SCIENCE

PhD Entrance Test Syllabus

PhD in Science: Electronics

Unit-I: Basic Circuit Theory

Superposition, Thevenin, Norton and Maximum Power Transfer Theorems, Network elements, Network graphs, Nodal and Mesh analysis. Laplace Transform, Fourier Transform and Z-transform. Time and frequency domain response, Passive filters, Two-port Network Parameters: Z, Y, ABCD and h parameters,Transfer functions, Signal representation, State variable method of circuit analysis, AC circuit analysis, Transient analysis, Zero, and Poles, Bode Plots

Unit-II: Electronic devices

Introduction to Semiconductor, PN Junction, Diode equation, Breakdown in diodes, Zener diode,

Three configurations of transistor, Biasing, BJT as an amplifier, BJT characteristics, Applications of Transistor.

FET- Construction and characteristics, Biasing, FET as an amplifier, Applications of FET. MOSFET: Introduction, Depletion and Enhancement type MOSFETs. Feedback concepts: Practical feedback circuits, Feedback amplifiers, Oscillator operation, types of oscillators

Unit-III:

Rectifiers, Voltage regulated ICs and regulated power supply.Amplifiers, Classification of amplifiers.

Operational Amplifiers

Op-amp Basics, parameters, Practical op-amp circuits – Integrator, Differentiator and Summing amplifier.

Op-amp Applications-Constant gain multiplier, Voltage to Current Converter, Current to Voltage Converter and filters.

GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Declared as Deemed to be University u/s 3 of UGC Act, 1956)
Visakhapatnam │ Hyderabad │ Bengaluru
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Unit-IV : Combinatorial and Sequential Logic Circuits

Combinatorial logic circuits

Simplification of Boolean expressions, Karnaugh map method, Logic gates, Encoders and Decoders, Multiplexers and Demultiplexers Binary addition, subtraction, multiplication and division.

Sequential logic circuits

Flip-Flops, Counters: Asynchronous (ripple) counters, Down counter, Synchronous counters, Up-down counter, Ringcounter, Johnson counter.

Unit-V: Electronic Communications & Microprocessors

Electronic Communications

Amplitude Modulation: Modulation Index, Frequency spectrum, Average Power. A.M Broadcast Transmitter and Superheterodyne receiver Output S/N ratio.
FM Modulation-Direct and Indirect methods. Detection methods - Slope detector, balanced slope detector, Amplitudelimiter, Pre-emphasis and De-emphasis.
PAM,PWM, ASK, FSK,PCM.

Microprocessors

Evolution of Microprocessors, Architecture and Pin Description of 8086, Instruction set. Memory organization- Register structure, Interfacing devices: 8255-I/O Ports and Programming, 8251-Serial communication interface and Programmable Interval Timer 8253 and Programmable Interrupt Controller 8259