GOA UNIVERSITY
Taleigao Plateau

SYLLABUS FOR GOA UNIVERSITY ADMISSIONS RANKING TEST (GU-ART) IN ELECTRONICS

Physics of Solid State Devices: Semiconductor, metal and insulator, electrical characteristics and energy band structure, Extrinsic and intrinsic semiconductors, FD statistics and carrier concentration, Diffusion and drift of carriers, I-V characteristics of junction diodes, BJT, FET, MOS I-V relationship, Small signal equivalent circuits, Photodiodes, Light emitting diodes.

Mathematics and Computer programming: First and Second Order differential equations, Basic matrix algebra, elementary statistics, elementary C programming.

General Knowledge on science and technology, household electrical gadgets (Fan, Household electrical wiring, Electric iron, Electric lamp, etc.), Energy conservation, environment pollution, scientific organizations in Goa, Major Indian research organizations/industries in Power, Computer Software, Textile, Consumer Electronics, Atomic Energy, Communication Engineering, Pharmaceuticals, Names of Inventors and Pioneers in Physics, Chemistry, Mathematics, Statistics, Electronics, Economics, Engineering, Oceanography Botany.

Networks and Circuit Theory: Nodal and Mesh Analysis, Thevenin's and Norton's Theorem, Maximum Power Transfer theorem, Sinusoidal steady state analysis, Time Domain analysis of simple RLC circuits.

Analog Electronics: Basic rectifier, clipping and clamping circuits, single stage CE amplifier (Gain and frequency response), Emitter follower, Differential amplifier, Op-amp specifications and simple applications (Inverting and Non-Inverting amplifier, differentiator, integrator, V-I converter), Power Amplifier (class A, B)

Digital Electronics: Boolean Algebra and truth table, Basic gates (AND, OR, NAND, NOR, etc.), number system (Decimal, Hexadecimal, Octal), TTL gates (specifications), SSI, MSI, VLSI, complexity, flip-flop and counters, RAM, ROM (basic concepts), ALU, elements of 8085 microprocessor, assembly language programming.

Communication Theory and practice: Elements of Vector calculus, gradient, divergence and curl, Maxwell's equations, Fourier analysis of signals, amplitude and frequency modulation, block diagram of radio receiver.

Instrumentation: Multimeter, CRO, Power supply.

Books recommended:

1. Network Lines and Fields, J. D. Ryder, Prentice Hall India.
2. Network Analysis, Van Vankelburg, Prentice Hall India.
3. Electronics Devices and Circuits, Millman and Halkias, Tata McGraw Hill.
4. Communication Engineering, Shrader, McGraw Hill.
5. Introduction to Electrodynamics, David J. Griffths.
6. Introduction to Mathematical Physics, Charlie Harper.
7. Programming with C, Bryon Gottfried, Schaum Series
8. Digital Principles and Applications, Malvino and Leach, McGraw Hill.
9. Microprocessor Architecture, Programming and Applications with 8085, Ramesh Gaonkar, Pernem International.
10. Communication Systems, Simon Haykins, Wiley
11. Competition Success Reviews and Competition Refresher