

**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,
DESIGN AND MANUFACTURING, KANCHEEPURAM,
CHENNAI – 600 127**

FACULTY RECRUITMENT

(Ref.: Advt. No. IIITDMK/R/2/2024 dated 15.07.2024)

SYLLABUS FOR WRITTEN TEST

Post: **Assistant Professor Grade-II (Level 10 and Level 11)**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Mathematics:

Linear algebra - Vector space, eigen values and eigen vectors, Solution of linear equations- existence and uniqueness, Rank. Statistics and probability - Mean, median, mode, standard deviation, Probability distributions, Joint and conditional probability. Vector Analysis - Gradient, divergence and curl, Gauss's, Green's, and Stokes' theorems. Differential Equations - First-order and higher-order linear equations, Cauchy's and Euler's equations, Complementary function and particular integral, Partial differential equations

Devices and Circuits:

Electronic Devices: Energy band and charge carriers in semiconductors, carrier concentrations, drift and diffusion, pn-junctions, MOSFET, Analog Circuits: Diode circuits, Amplifiers – Biasing, AC coupling, small signal analysis & frequency response, differential amplifiers, current mirrors, Op-amp circuits – Amplifiers, summer, differentiator, integrator, active filter, Schmitt triggers, oscillators, Digital circuits: combinational and sequential circuits, ADC and DAC, memories, computer organization

Digital Signal Processing:

Elementary signals, LTI System and its properties, Impulse response and convolution, Fourier series, Fourier Transforms, Discrete-time processing of continuous-time signals, DTFT, DFT, z-transform, poles and zeroes, Implementation of Discrete-time systems – FIR and IIR, Sampling and reconstruction of signals

Communication:

Autocorrelation and power spectral density, white noise, Analog communication: Amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers. Digital communication: Digital modulation schemes, BER and SNR, inter-symbol interference, MAP and ML detection, Information theory: entropy, mutual information, channel capacity theorem, Error correction codes, Wireless communication: Wireless channel, fading

Electromagnetics:

Maxwell's equations and boundary conditions, Plane waves and its properties, Electromagnetic wave propagation in media: lossless, lossy dielectrics and conductors, Reflection and transmission of electromagnetic waves at interfaces, rectangular waveguides, basics of radiation.
