

TAMIL NADU PUBLIC SERVICE COMMISSION

SYLLABUS

ELECTRONICS AND TELECOMMUNICATION ENGG

DEGREE STANDARD

Code No.185

PART A

Unit I

Devices, Circuits , Rectifiers and Power Supplies

Diodes and Transistors - PN Contact, Zener, Varactor, Tunnel - LED- I/O Characteristics - BJT, UJT, FET, JFET, MOSFET, CMOS, IGBT- IGBT - Basic Principles, IGBT as a Switch Opto Electronics Devices - Thyristor Devices - Basic Constructions, Characteristics and Two Transistor models of SCR - Biasing and Stabilisation of Transistor Circuits - Analysis using h Parameter - Calculation of gain , Impedance and Bandwidth - Rectifier - Introduction- Classification of Rectifiers - Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Efficiency - Ripple factor - Applications- Filters - C, LC and PI Filters.

Unit II

Amplifiers and Oscillators

Design and Analysis of RC, DC Coupled, Large signal amplifiers - Differential amplifiers and tuned amplifiers - Oscillators - Criteria for Oscillation, Resonance type oscillators - RC Phase Shift - Wein Bridge Oscillators - Astable, Bistable Monostable , Schmitt Trigger - Saw Tooth generation using UJT and BJT.

Unit III

Linear and Digital Integrated Circuits:

Linear ICs, IC fabrication Techniques - Operational Amplifier, Timers and their Applications, A/D and D/A Converters.

Digital Circuits:

Boolean Algebra, Combinational Logic - Flip Flops- RS, D, T - JK - Counters, - Shift Registers, - D/A - A/D and Memories - Static - Dynamic - SDRAM - DDR RAM .

Unit IV

Microprocessors and Micro Controllers

Microprocessor and Applications – Architecture of 8085 and 8086 – Instruction Set – Addressing Techniques – Memory Mapping – Interrupts – Architecture of 8051 – Instruction Set – IO Timer Interrupts – Serial Programming – Interfacing external device with 8051 and 8085.

Unit V

Micro Wave Devices and Circuits

Microwave Devices, Schottky, PIN Diodes, Gunn Diodes, Microwave Amplifiers, and Oscillators. Microwave Components, Microwave Measurements.

Telecommunication Engineering

PART B

Unit I

Telephony

Telephony and FAX- Telephone System – Public Telephone Networks, Private Telephone Networks – Electronic Switching System – Cordless Phone – Video Phone – ISDN – Features – Wired Technology – Radio Telemetry – Morse Code – Telegraph TXV – Telegraph Receiver – Merits and Demerits of Telegraph System – Radio Telephone – Facsimile Communication System – Introduction Facsimile Sender / Receiver – Phasing - Index of Co Operation.

Unit II

AM / FM Transmitter / Receivers

AGC Types, SSB Receivers - Phase Modulation – Principles – Phase Modulation Comparison bet FM and PM - Pulse Modulation – Types, Sampling Theorem, Generation and Detection of PAM, PWM and PPM - PCM – Transmitter and Receiver –Noise.

Unit III

Transmission Lines, Antennas and Propagation

Symmetrical and Asymmetrical Networks – Alternators – filters – Transmission Lines – Equivalent Circuit – Wave Guides – types and advantages - Antennas – Isotropic Radiation – Basic Antenna Principle – Radiation Pattern – Broadside and end fire array – Yagi antenna –

Parabolic Antenna - Microwave antenna Propagation - Ground wave, Surface Wave, Space Wave, ionosphere Propagation.

Unit IV

Analog and Digital Signal Processing

Signals and Systems: Introduction - Vector Space - Concepts - Representation of Signals - Linear time invariant Systems - Discrete time Signals and Discrete time Systems.

Digital Signal Processing:

Introduction - Architecture - 2407 - Programmable Control - Addressing Modes and Institution of System Configuration and Interrupts - Digital and ADC - Event Manager and PWM generator - Symmetric PWM wave form generator.

Unit V

Radar and Navigational Aids

Radar Fundamentals - Basic Radar System - Functions influencing Max Range - Target Proper Pulsed Systems - Basic Pulsed radar System - Block diagram - Display methods - PPI Display. - Automatic Target Detection - Navigational Techniques - Direction Finding - Ranges - Radio Compass - Radio Telemetry - ILS - GCA System.

Unit VI

Satellite Communication

Satellite System - Keplers I, II, Laws - Types of Geo Stationery synchronous Satellites - Ad - LEO, MEO - Advantages - Apogee - Active and Passive Satellite - Earth EC of Satellite - Launching Orbit - Parabola reflector antenna - Cassegrain - Antenna - Space Segment - Receive only Home TV System - Transmit / Receive - Earth Station Block Satellite services - INTELSAT - GPS .

Unit VII

Television Engineering

Simple Block Diagram of Transmission and Reception System - Composite Signal - TV Broadcast Channel Allocation Different TV Standard - CCTR - B Systems for Color Transmission - Flat Panel Display - Large Screen Display - Plasma Display - Schematic diagram of a Control IR - Synthesis of Remote Control - SIS Functions of Remote transmitter and receiver IC M 50463 P and M50142P - Modern Cable TV System - Schematic diagram VCD DVD - Block Diagram.

Unit VIII

Digital Communication

Noise - Cross Talk - Distinction - Equalizers - Echo Compressors - Digital Codes - ASCII Codes - Error Detection Codes - Hamming Codes - Digital Modulation Techniques - ASK - FSK - PSK - Classification of Modems - Modem Interfacing.

Mobile Communication:

Cellular Telephone - Frequency Reuse - Improve and Capacity - Cell Splitting Roaming and TDMA - FDMA - GSM CDMA - Digital accumulator - Global System for Mobile Communication - GSM Seminar - GSM System architecture - Radio Sub System.

Fiber Optic Communication:

Optical Fiber, Optical Loss, Modes and Configuration, Fiber Materials at the Signal Distortion, Optical Sources, Lasers - Modulation a reliability to Fiber to Fiber Joint - Splicing technology optical receivers - Photo Diodes -detections.

Information Theory and Coding

Information Measure - Properties of Various enterprises - Noiseless Coding - Kraft McMillan - Inequality - Huffman's Method of Coding - Coding Theorem - Noisy Coding - Classification of Channels and their Calculations - Decoding Schemes - Correlations Receiver - Matched Filter - Wiener Filter - Linear estimation - Testing of hypothesis, Parameter Estimation.