TAMIL NADU PUBLIC SERVICE COMMISSION
SYLLABUS
ELECTRONICS ENGINEERING /
ELECTRONICS & COMMUNICATION ENGINEERING
(DIPLOMA STANDARD)

CODE: 447

UNIT - I: ELECTRONIC DEVICES AND CIRCUITS

PN junction Diode -Zener diode-Filters - Capacitor filter - Inductor filter - L section filter - Pi section and RC filter - Rectifier: Half Wave, Full Wave and Bridge Rectifier – Opto electronic devices - Photo diode, Photo transistor and Opto coupler - Bipolar junction transistor (BJT) – Biasing – Configuration – Common Emitter Amplifier - Field effect transistor (FET) - Uni junction transistor (UJT) – Feedback - Effects of negative feedback - Transistor amplifiers - RC coupled amplifier - Transistor oscillators – Barkhausen criterion – Hartley Oscillator – Colpitts Oscillator – RC Phase shift oscillator – SCR – DIAC –TRIAC - Clippers and Clamper - Voltage Multipliers – Astable, Monostable Multivibrator using Transistors and Schmitt Trigger using Transistors.

UNIT- II: ELECTRICAL CIRCUITS AND INSTRUMENTATION

Ohm's law - Kirchhoff's current law and Kirchhoff's voltage law - Network theorems (DC Circuits only): Thevenin's theorem, Superposition theorem and Maximum power transfer theorem - A.C Circuits - Resonance – Transformer -Single phase and three phase supply - DC Generator - DC motor – Single phase induction motor – Three phase induction motor – Capacitor start induction motor – Stepper motor – Universal Motor – Transducers – CRO –Thermocouple - Resistance measurement: Wheatstone bridge – Measurement of Inductance: Maxwell's bridge – Measurement of Capacitance: Schering Bridge.

UNIT –III:

(A) PROGRAMMING IN C

Structure of C program - Compiler, Linker - Low level and High level Programming language - C character set –Tokens – Constants – Key words – Variables – Data types - I/O statements - Operators: Arithmetic, Logical, Assignment, Relational, Increment, Decrement, Conditional, Bitwise and Special operators – Precedence and Associativity - Decision making, branching and looping statements - Arrays and Strings - Structure and Union - Function.

(B) COMPUTER HARDWARE SERVICING AND NETWORKING

Mother board components – Memory Storage devices - I/O Devices and Interface - Maintenance and troubleshooting of desktops and laptops - Computer Network Devices and OSI Layers - 802.X and TCP/IP protocols.

UNIT -IV: INDUSTRIAL ELECTRONICS

Thyristor family: Insulated gate bipolar transistor (IGBT), MOSFET and GTO-Trigger Circuits - Converters - Single phase Half controlled ,fully controlled bridge converter with R load and RL load - importance of flywheel diode-Commutation: Natural commutation – Forced commutation – Choppers – Inverters - SMPS, UPS - PROGRAMMABLE LOGIC CONTROLLER (PLC) - PLC functions-Building blocks of a Robot - Robot Sensor.

UNIT -V: ANALOG AND DIGITAL ELECTRONICS

Operational amplifier (IC 741) Op-amp applications - Timer (IC 555) – applications – PLL (IC 565) - VCO (IC 566) - IC Voltage Regulators (78XX, 79XX, LM 723) - Number system - Basic Boolean laws - De-Morgan's

theorems – Logic gates - Combinational circuits: Arithmetic circuits, Encoder and decoder, Multiplexer, Demultiplexer, Parity checker and generator - Sequential circuits: Flip flops, Counters, Shift registers - Analog to digital conversion using Successive approximation method, Ramp method and Dual slope method - Weighted Resistor D/A converter – R-2R Ladder D/A converter - Classification of memories.

UNIT – VI: COMMUNICATION ENGINEERING

Networks – Filters (LPF, HPF, BPF) – Antennas – Propagation – Modulation – Amplitude modulation – AM transmitter, receiver – Frequency modulation – FM transmitter, receiver - Pulse modulation – Audio system: Microphone, loud speaker – Video system: Mono chrome TV, Color TV.

UNIT – VII: ANALOG AND DIGITAL COMMUNICATION SYSTEMS

Radar System – Telephone system: PSTN, ISDN – Digital communication – Digital codes - Optical communication – Satellite communication – Microwave communication – Mobile communication (Qualitative treatment only) – Satellite multiple access techniques.

UNIT – VIII: MICROCONTROLLER AND ITS APPLICATIONS

8051 microcontroller – Architecture – Instruction set – Addressing modes – Assembly Language Programmes – Peripherals of 8051 - I/O Ports – Timer/Counter - Serial communication – Interrupts - IC 8255 - Interfacing with 8051 - Advanced Microcontrollers - PIC microcontroller – Arduino - Raspberry pi - IoT.

UNIT – IX: VERY LARGE SCALE INTEGRATED CIRCUIT

NMOS, CMOS logic - VLSI design process - VHDL code for combinational circuit - VHDL code for sequential circuit – PLDs: PROM, PLA, PAL, CPLD – FPGA - ASIC.

UNIT – X: EMBEDDED SYSTEM

Harvard and Von-Neumann architectures - RISC and CISC Processors - ARM processor architecture – Instruction sets – LPC 2148 ARM Controller - System control functions - LPC 2148 Peripherals - Serial communication in LPC 2148 - Embedded OS and RTOS.

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