

**TAMIL NADU PUBLIC SERVICE COMMISSION  
SYLLABUS**

**Code No.170**

**SUBJECT: ELECTRONICS ENGINEERING  
(DEGREE STANDARD)**

**UNIT I Atomic Structure & Basic Electronic Components**

Atomic structure of materials, Energy band, Insulators, conductor and semiconductor  
Electric fields, potential difference, electric current, Resistor Capacitors, Inductors and  
Transformers - properties, types and applications,

**UNIT II AC and DC Circuits**

Ohms law, Kirchoffs laws, Series and parallel resistance, equivalent resistance, Current  
division and voltage division rule- Principle of Inductor and capacitor- Alternating voltage  
parameters – Amplitude, frequency, phase, RMS, peak to peak, average values.  
Mechanical & nodal analysis of AC & DC circuits. Thevenin's & maximum power  
theorems

**UNIT III Semiconductor devices**

Current in a semiconductor, semiconductor Junction - characteristics and typical  
applications of PN junction diode, Zener diode, Junction and Field Effect Transistors,  
UJT, SCR, LED, Photodetectors.

**UNIT IV Analog circuits**

Small signal amplifiers using BJTs and FETs Basic definitions and characteristics,  
Power amplifiers- types (Class A,B,C &D), Pushpull amplifiers - efficiency. – Multistage  
Amplifiers - Rectifier and Power Supply Circuits

**UNIT V Linear Integrated Circuits**

Fabrication principles of IC's - Operational Amplifiers – properties. Applications: Adder,  
subtractor, Inverting and non inverting amplifiers, filters, comparator, Integrator and  
differentiator.

**UNIT VI Digital circuits**

Basics of Boolean Logic - Logic Gates, Flip-Flops, Shift-Registers, Counters,  
Decoders/Drivers, Timer, Display Devices, A/D and D/A Convertors

**7. Microprocessors and Applications**

Architecture of 8085 / 8086 processors, Address Modes Instruction set, Assembly-  
language programming, Peripherals and Interfacing.

**8. Communication techniques**

Generation of AM- DSB –SSB and VSB signals. FM generation – properties,  
Modulation Index, Power relations. Digital modulations – PCM.ASK, FSK and PSK  
techniques.

## **9. Measurements and Instruments**

Definitions of Accuracy, Precision, Sensitivity, Resolution, Linearity, Range, Measurement of Electrical Quantities - Voltmeter, Ammeter, Watt-meter, CRO, Measurement of Non-electrical Quantities

## **10. Communication Networks**

OSI layer model, Network topology, LAN, WAN and MAN structures. Principles of cellular mobile communications.

## **11. Electromagnetic Fields and Waves**

Electric field intensity and potential due to point, line, plane and spherical charge distribution, dielectric, capacitance calculations for simple configurations; Ampere's and Biot-Savart's law

Gauss' and Stokes' theorems, Wave equation.

### References:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj - Electronics Devices and Circuits, Tata McGrawHill publishing company Ltd, New Delhi 2002.
2. R.S.Sedha – A text book of Applied Electronics, S.Chand and Company Ltd, NewDelhi. 2006.
3. Millman and Halkias – Integrated Electronics, Tata McGrawHill publishing company Ltd, New Delhi 2004.
4. B.L Theraja – Electrical Technology Part – 4 (Electronic Devices and Circuits), S.Chand and Company Ltd, NewDelhi. 2005.
5. Kennedy and Davis – Electronic Communication systems, 4<sup>th</sup> ed, Tata McGrawHill publishing company Ltd, New Delhi 2006.
6. Blake - Electronic Communication systems, Thomson Asia Pte Ltd. Singapore, 2002.