

AP5071 NANOELECTRONICS

DETAILED SYLLABUS

OBJECTIVES

- To understand how transistor as Nano device
- To understand various forms of Nano Devices
- To understand the Nano Sensors

UNIT I SEMICONDUCTOR NANO DEVICES

Single-Electron Devices; Nano scale MOSFET – Resonant Tunneling Transistor - Single-Electron Transistors; Nanorobotics and Nanomanipulation; Mechanical Molecular Nanodevices; Nano computers: Optical Fibers for Nanodevices; Photochemical Molecular Devices; DNA-Based Nanodevices; Gas-Based Nanodevices.

UNIT II ELECTRONIC AND PHOTONIC MOLECULAR MATERIALS

Preparation – Electroluminescent Organic materials - Laser Diodes - Quantum well lasers:- Quantum cascade lasers- Cascade surface-emitting photonic crystal laser- Quantum dot lasers - Quantum wire lasers:- White LEDs - LEDs based on nanowires - LEDs based on nanotubes - LEDs based on nanorods - High Efficiency Materials for OLEDs- High Efficiency Materials for OLEDs - Quantum well infrared photo detectors.

UNIT III THERMAL SENSORS

Thermal energy sensors -temperature sensors, heat sensors - Electromagnetic sensors – electrical resistance sensors, electrical current sensors, electrical voltage sensors, electrical power sensors, magnetism sensors - Mechanical sensors - pressure sensors, gas and liquid flow sensors, position sensors - Chemical sensors - Optical and radiation sensors.

UNIT IV GAS SENSOR MATERIALS

Criteria for the choice of materials - Experimental aspects – materials, properties, measurement of gas sensing property, sensitivity; Discussion of sensors for various gases, Gas sensors based on semiconductor devices.

UNIT V BIOSENSORS

Principles - DNA based biosensors – Protein based biosensors – materials for biosensor applications - fabrication of biosensors - future potential.

Diploma, Anna University-UG, PG., HSC & SSLC

Notes

Syllabus

Question Papers

Results and Many more...

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www.AllAbtEngg.com

REFERENCES

1. K.E. Drexler, "Nano systems", Wiley, 1992.
2. M.C. Petty, "Introduction to Molecular Electronics", 1995.
3. W. Ranier, "Nano Electronics and Information Technology", Wiley, 2003.