

**B.Sc. ELECTRONICS SYLLABUS**  
**B.Sc. I YEAR**  
**Semester - II**  
**DSC- Paper –II : Electronic Devices**

Total number of hours : 56  
No of hours per week: 4  
Credits :4

**UNIT-I**

**PN Junction:** Formation of PN junction, Depletion region, Junction capacitance, Diode equation (no derivation) Effect of temperature on reverse saturation current, V - I characteristics and simple applications of i) Junction diode, ii) Zener diode, iii) Tunnel diode and iv) Varactor diode.

**UNIT-II**

**Bipolar Junction Transistor( BJT) :** PNP and NPN transistors, current components in BJT, BJT static characteristics ( Input and Output ) , Early effect , CB , CC , CE configurations of transistor and bias conditions ( cut off, active, and saturation regions ), CE configuration as two port network,  $h$  – parameter model and its equivalent circuit. Determination of  $h$  – parameters from the characteristics. Load line analysis ( AC and DC ). Transistor Biasing – Fixed and self bias.

**UNIT- III**

**Field Effect Transistor ( FET ):** Construction and working of JFET, output and transfer characteristics of FET, Determination of FET parameters. Application of FET as Voltage variable resistor. Advantages of FET over BJT. **MOSFET ::** construction and working of enhancement and depletion modes , output and transfer characteristics Application of MOSFET as a switch .

**Uni Junction Transistor (UJT):** Construction and working of UJT and its Characteristics. Application of UJT as a relaxation oscillator.

**UNIT- IV**

**Silicon Controlled Rectifier (SCR):** Construction and working of SCR. Two transistor representation, Characteristics of SCR. Application of SCR for power control.

**Photo electronic Devices:** Construction and Characteristics of Light Dependent Resistor (LDR), Photo voltaic Cell, Photo diode, Photo transistor and Light Emitting Diode(LED).

**Books Recommended:**

- 1) Electronic Devices and circuits-Millman and Halkias,(TMH)
- 2) Principles of Electronics-V.K.Mehta & Rohit Mehta
- 3) Electronic Devices and Circuits-Allen Molter shed(PHI)
- 4) Basic Electronics and Linear Circuits-Bharghava U
- 5) Electronic Devices and Circuits-Y.N.Bapat
- 6) Electronic Devices and Circuits-Mithal.
- 7) Experiments in Electronics-S.V.Subramanyam.

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**B.Sc. I Year, Semester – II : Electronics Practical  
Paper – II : Electronic Devices Lab**

**No. of hours per week: 3**

1. To draw volt- ampere characteristics of Junction diode and determine the cut – in voltage, forward and reverse resistances.
2. Zener diode V – I Characteristics – Determination of Zener breakdown voltage.
3. Voltage regulator ( line and load ) using Zener diode.
4. BJT input and output characteristics (CE configuration) and determination of 'h' parameters.
5. FET – Characteristics and determination of FET parameters.
6. UJT characteristics – determination of intrinsic standoff ratio.
7. UJT as relaxation oscillator.
- 8 Characteristics of LDR/Photo diode/Photo transistor/Solar cell.

**Note: Student has to perform minimum of Six experiments.**

**Reference Books:**

- 1) Lab manual for Electronic Devices and Circuits – 4<sup>th</sup> Edition. By David A Bell - PHI

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