

**Basic Electronics [BE]**  
S.E. Sem. III [ELEC]

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**EVALUATION SYSTEM**

	<b>Time</b>	<b>Marks</b>
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical &amp; Oral Exam</b>	2 Hrs.	50
<b>Oral Exam</b>	–	–
<b>Term Work</b>	–	25

**SYLLABUS**

**1. Types of Diodes and Applications**

**Types of diodes:** Zener, Varactor, Schottky and PIN diodes.

**Rectifier and Filter Analysis:** specification of the devices and components required for C, L, LC, CLC & RC filter.

**Clippers and clampers:** Single and double ended clipping circuits, clamping circuits, voltage doubler circuit.

**2. Bipolar Junction Transistor:**

**Biasing Circuits:** Types, dc circuit analysis, load line, thermal runaway, stability factor analysis, thermal stabilization and compensation.

**Modeling:** Small signal analysis of all configurations with different biasing network using h-parameter model. Introduction to  $r_e$ -model and hybrid- $\pi$  model.

**Amplification:** Derivation of expression for voltage gain, current gain, input impedance and output impedance of CC, CB, CE amplifiers.

**3. Field Effect Transistor:**

**JFET and MOSFET :**Types, construction and their characteristics, Biasing circuits for FET amplifiers, FET small signal analysis, derivation of expressions for voltage gain and output impedance of CS and CD amplifiers.

**4. Low and High Frequency Analysis of BJT and JFET amplifier circuits.**

**5. Feedback Amplifiers (Negative Feedback) :** Introduction to positive and negative feedback, negative feedback– current, voltage, Series and Shunt type. It's effect on input impedance, output impedance, voltage gain, current gain and bandwidth.

**6. DC and AC analysis of differential amplifier,** single and dual inputs and balanced and unbalanced outputs using BJT. FET differential amplifier.

**7. Optoelectronic devices:** Photoconductive, photo emissive and photovoltaic devices, principle, construction and applications, LED, photodiode, phototransistor, solar cell, optoisolators

**Reference :**

1. Electronic Devices and Circuits (*Robert Boylested and Louis Nashelsky*) Prentice-Hall of India.
2. Electronic Devices and Circuits (*Millman and Halkias*) Tata McGraw Hill.
3. Electronic Devices (*Thomas Floyd*) Prentice-Hall of India.
4. OP-AMPS and Linear IC's (*Ramakant A. Gayakwad*).
5. Electronic Circuit Analysis and Design (*Newman D.A.*) McGraw Hill Int. (2<sup>nd</sup> Edition).
5. Electronic Devices and Circuits (*David Bell*) Oxford University Press.

