PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

SUBJECT: Electrical and Electronics Engineering **SUBJECT CODE: 03010601ES02**

Assignment-3 Diode and Transistors

	1.	Explain the following terms. (1) Semiconductor material (2) P-Type Material (3) N-type Material (4) Doping (5) Ripple Factor
	2.	With a neat sketch, explain the V-I characteristics of the PN junction diode in forward and reverse bias.
	3.	Give the classification of the Rectifier & explain the full wave rectifier.
	4.	Why filter circuit is required? What are components can be used as filter elements?
	5.	What do you mean by clipping circuits? Explain positive series clipper and negative biased parallel clipper
	6.	What is a clamper circuit? Explain the positive and negative clamper circuit with waveforms and circuit diagrams
	7.	Give the comparison between the clipper and clamper circuit.
	8.	Draw the output characteristics of BJT. Explain the different operating regions in the output characteristic.
	9.	Explain the transistor as a switch along with its operating regions and list the application of the transistor.
	10.	Draw and explain the input and output characteristics of a transistor in CB Configuration.
	11.	What are the differences between Common base, common emitter, and common collector configuration?
	12.	Explain the Circuit of the common emitter amplifier in detail.
	13.	Explain the construction and working of a PN junction diode with a neat diagram.
	14.	Describe the working of a half-wave rectifier with a circuit diagram. Derive an expression for its efficiency.
	15.	A series clipper circuit is used to remove voltages below 4V from an AC input of ±10V. Draw the circuit diagram and expected output waveform.
	16.	Explain the working of a voltage doubler circuit with a circuit diagram.
	17.	Draw the circuit diagram of a common emitter BJT amplifier with a voltage divider bias circuit. Explain the operation of the circuit and calculate the voltage gain.

	18.	Explain the operation of a BJT in the active region, including the role of the base current, collector current, and emitter current.
	19.	Draw the circuit diagram of a BJT amplifier circuit with a common base configuration. Explain the operation of the circuit and calculate the current gain and voltage gain of the transistor.
	20.	What are the advantages of using a voltage multiplier instead of a transformer? List two practical applications of voltage doublers and triplers.
	21.	Why does a clamper circuit require a capacitor, while a clipper circuit does not? What will happen if a diode is reversed in a series clipper circuit?
	22.	Explain the role of a Zener diode in a clipper circuit. How does it differ from a normal diode in clipping applications?