

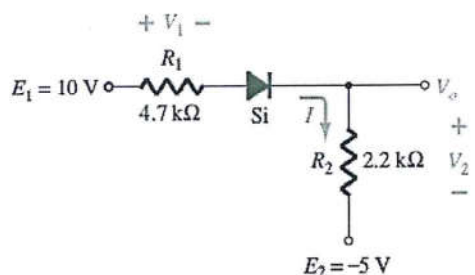
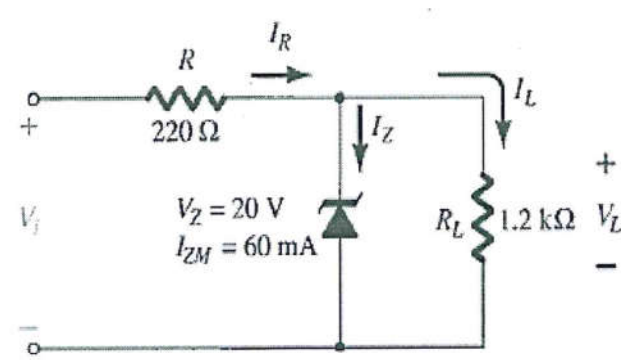
**END SEMESTER ASSESSMENT (ESA) B.TECH I / II SEMESTER- Dec 2019**

**UE15/16EC101- BASIC ELECTRONICS**

Time: 3 Hrs

Answer All Questions

Max Marks: 100

1.	a) Explain diode models with the help of equivalent circuits and their V-I characteristics.	10M
	b) Determine $I$ , $V_1$ , $V_2$ , and $V_O$ for the series dc configuration <div data-bbox="552 609 1023 882" data-label="Diagram">  </div>	10M
2.	a) Draw the circuit diagram of a Bridge Full Wave Rectifier & Center Tap Rectifier, explain the operation with the required equivalent circuits and waveform. Also calculate the required PIV of each diode.	10M
	b) Determine the range of values of $V_i$ that will maintain the Zener diode of the circuit shown in the “on” state. Find $V_{max}$ , $V_{min}$ , $I_L$ , $I_{max}$ , write the formulae used. <div data-bbox="552 1281 1169 1638" data-label="Diagram">  </div>	10M

	<p>3. a) Write the truth table of a Full-adder and write the SOP expression for its outputs. Realise the SUM &amp; CARRY output using a 4-to-1 MUX.</p> <p>b) Explain the working of RS latch using NOR gates with a circuit diagram. Write the truth table.</p> <p>4. a) Define <math>\alpha</math> and <math>\beta</math> of a Bipolar Junction Transistor and derive the relation between them. Mention all the regions of operation of a BJT, stating the biasing conditions for these regions.</p> <p>b) Calculate the currents <math>I_i</math>, <math>I_L</math>, output voltage <math>V_0</math> and voltage gain <math>A_v</math> for the network if  i) <math>V_i = 200 \text{ mV}</math> and <math>R = 5 \text{ k}\Omega</math> and  ii) if <math>V_i</math> value is replaced by <math>400 \text{ mV}</math> and <math>R</math> by <math>1 \text{ K}\Omega</math> for the same <math>R_i</math> &amp; <math>R_o</math>.</p>	<p>10M</p> <p>10M</p> <p>10M</p> <p>10M</p>
	<p>5. a) Draw the AC equivalent circuit of an op-amp and define the parameters which appear in it. With the help of a circuit diagram and waveform explain the working of a basic comparator.</p> <p>b) Identify each stage and find the output voltage <math>V_0</math>.</p>	<p>10M</p> <p>10M</p>

