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# PES University, Bangalore

(Established under Karnataka Act No. 16 of 2013)

**UE20EC101**

**May 2022: END SEMESTER ASSESSMENT- B.TECH. I/II SEMESTER**

**UE20EC101 – Electronic Principles and Devices**

Time: 180 mins | Answer All Questions | Max Marks: 100

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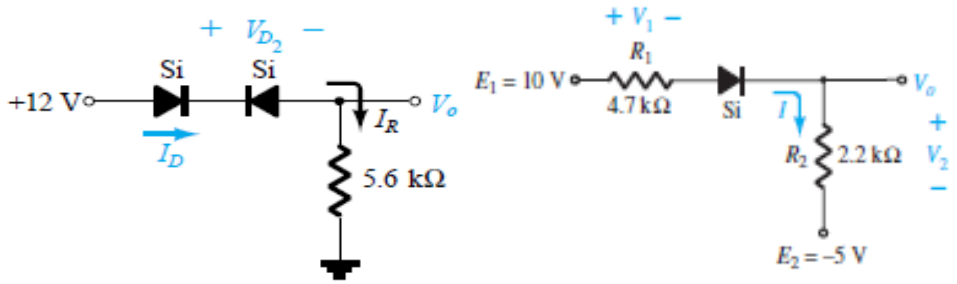
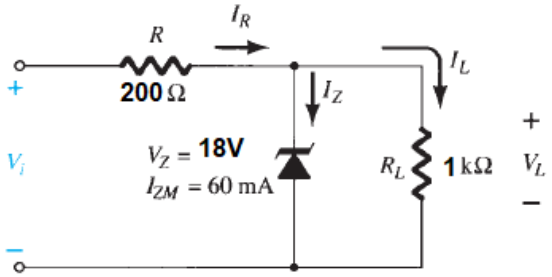
|---|---|---|---|
| 1. | a | With a neat circuit diagram Explain Forward and Reverse Characteristics of a semiconductor Diode. Discuss the effect of Temperature on V-I Characteristics. | 8 M |
| | b | Use Second approximation for a diode to determine the unknown values for the following.<br><br>(i) Determine $I_D$ and $V_o$ for the circuit shown in the Figure below. (ii) Determine I and $V_0$ for the circuit shown in the Figure below<br><br>  | 6M |
| | c | Using Shockley's equation, Find the diode current $I_d$ for a silicon Diode if the applied voltage $V_D$=0.71 V if the Reverse Saturation is 4 x $10^{-12}$ A at a temp of $30^0$ C. Consider ($\eta$=1). Find the new $I_d$ if the temperature is increased by $20^0$C.assuming same $V_D$. | 6M |
| 2. | a | Calculate the RMS value of the ripple voltage for the FWR if a 100µF Capacitor is connected to a load drawing 50mA of current. What is the dc voltage at the output if the peak rectified output voltage is 30V and frequency is 50Hz? Also find the ripple factor. | 7M |
| | b | With a neat diagram, explain the working principle of Full wave Rectifier with Centre tapped Transformer and derive the expression for $V_{dc}$ and $V_{rms}$ | 6M |
| | c | Determine the range of values of Vi that will maintain the Zener diode in the "on" state for the following Circuit.<br><br>  | 7M |
| 3. | a | Explain the following Logical gates and realize using any Universal Gates.<br><br>(i) NOR (ii) XOR (iii) AND (iv) NOT | 8 M |

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| | b | With Characteristic Table and a neat circuit Diagram using ONLY NAND Gates, explain JK Flip flop. | 6 M |
| | c | Define shift register. Draw the circuit diagram for 4-bit shift register and explain with example. | 6 M |
| 4. | a | With a neat diagram, explain the Input and output V-I characteristics of PNP Common Base BJT. Find the value of $\alpha$ and $I_B$, if $I_E$ = 1.32mA and $I_C$ = 1.11mA. | 7M |
| | b | With a neat block diagram, explain Communication System. | 7M |
| | c | What are the Principles of Cellular Communication? Explain | 6 M |
| 5 | a | Give the Differences between Microprocessor and Microcontroller | 8M |
| | b | Explain the Data Flow Model of ARM Processor with a neat diagram. | 4 M |
| | c | With examples illustrate the usage of embedded systems for the following various Applications. | 8 M |
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