

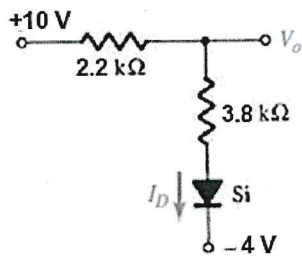
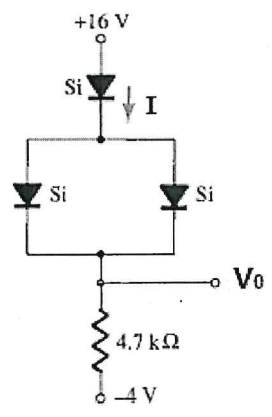
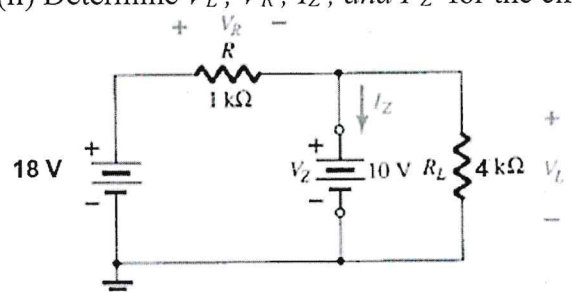
**March 2022: END SEMESTER ASSESSMENT- B.TECH. I SEMESTER**

**UE21EC141A –Electronic Principles and Devices**

Time: 180 mins

Answer All Questions

Max Marks: 100

1.	a	Explain the following: (i) First and Second Diode Approximations (ii) Illustration of Logical OR Operation using Diode (iii) Avalanche breakdown	6M
	b	<p>Solve the following using second approximation for a diode.</p> <p>(i) Determine <math>V_o</math> and <math>I_D</math></p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>Determine <math>I</math> and <math>V_o</math>, for the circuit shown below</p>  </div> </div>	8M
	c	Using Shockley's equation, Find the diode current $I_d$ for a silicon Diode, if the applied voltage $V_D=0.72$ and Reverse Saturation Current is $2 \times 10^{-12}$ A at a temp of $30^\circ$ C. Consider ( $\eta=1$ ). Find the new current $I_d$ if the Temperature is increased to $50^\circ$ C	6M
2.	a	With a neat diagram and Waveform explain the working principle of Full wave Bridge Rectifier with C Filter	6M
	b	Derive the expression for $I_{dc}$ , $I_{rms}$ for centre Tap Full wave Rectifier and hence find the efficiency and ripple factor of the Rectifier.	6M
	c	<p><b>Solve the Following</b></p> <p>(i) For a half wave rectifier with ideal diode, an ac voltage of RMS value 20V, 50Hz is applied. If the load resistance is <math>200\Omega</math>, find the dc output voltage, dc output current output frequency and ripple factor across the load resistance.</p> <p>(ii) Determine <math>V_L</math>, <math>V_R</math>, <math>I_Z</math>, and <math>P_Z</math> for the circuit shown below.</p> <div style="text-align: center;">  </div>	8M



3.	a	Realize the Following Gates using NAND gates only (i) OR gate (ii) XOR gate (iii) NOR gate	6 M
	b	Simplify the given Boolean expression and implement the circuit using Basic gates $\overline{(\overline{X}Y + \overline{X} + XY)} + (X\overline{Y})$	4 M
	c	With a neat diagram explain 4:1 Multiplexer and derive the Boolean expression and Logic diagram using function Table	6 M
	d	Explain 3 bit Asynchronous up-counter with Circuit diagram, Characteristic Table and timing Diagram.	4M
4.	a	With a neat diagram, explain the V-I characteristics of NPN BJT Common Base configuration. Find the value of $I_C$ , $\alpha$ and $\beta$ if $I_E = 1.5\text{mA}$ and $I_B = 25\mu\text{A}$ .	8M
	b	Explain Communication System with a neat block diagram.	6 M
	c	With respect to Cellular Communication, define the following 1) Hand off 2) Roaming 3) Co-channel Interference	6 M
5	a	Define Embedded System and Mention the various applications of Embedded systems with examples	6M
	b	Draw the Data Flow Model of ARM Processor and explain the same.	8M
	c	Describe any three of the following (i) Random Access Memory (RAM) (ii) Wireless communication interface (iii) Onboard Communication Interface (iv) Microcontroller (v) ARM 7 Current Program Status Register	6M

