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PES University, Bangalore

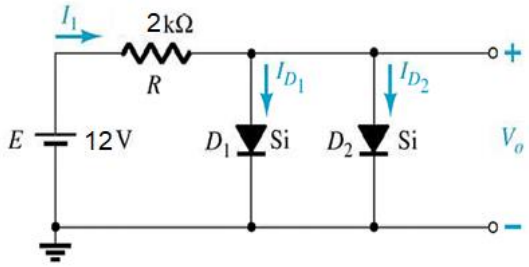
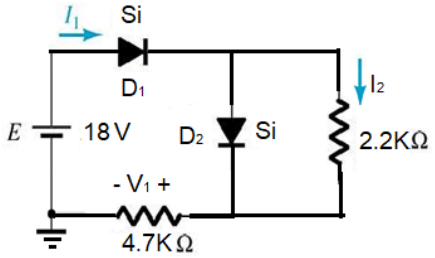
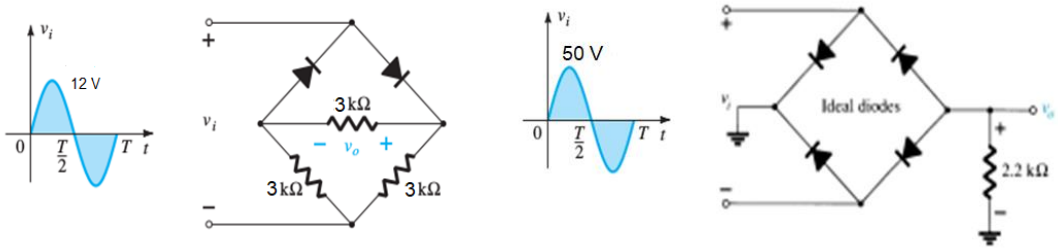
(Established under Karnataka Act No. 16 of 2013)

UE20EC101

April 2021: END SEMESTER ASSESSMENT- B.TECH. I SEMESTER

UE20EC101 –Electronic Principles and Devices

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

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.	7M
	b	Solve the following using second approximation for a diode. (i) Determine Vo, I_1, I_{D1}, and I_{D2} for the circuit shown in the Figure below.  (ii) Determine I_1, I_2 and V_1 for the circuit shown in the Figure below  	7M
	c	Using Shockley's equation, Calculate the applied voltage V_D, if diode current is 5mA, thermal voltage is 26.4 mV and Reverse saturation current is 1.2nA. Consider Ideality factor as 1.	6M
2.	a	For the following Circuits, Determine the output waveform for the network and calculate the output dc level and the required PIV of each diode. Consider Ideal Diodes. (i) (ii)  	7M

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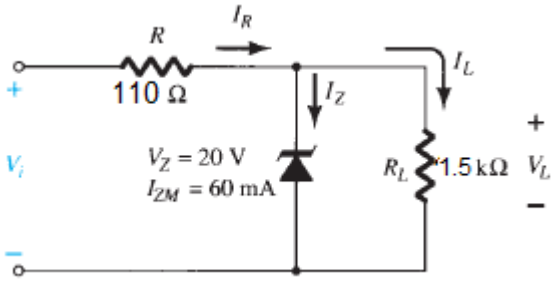
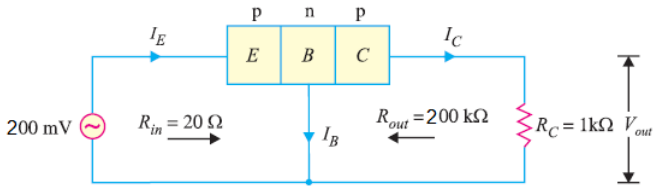
	b	With a neat diagram explain working principle of Full wave Rectifier (centre-Tap) with C filter. Considering 500µF capacitor with load current of 150mA at 3% ripple calculate the dc voltage. Assume f=50Hz.	7M
	c	Determine the range of values of V_i that will maintain the Zener diode in the "on" state. 	6M
3.	a	Simplify the given Boolean expression and Realize the same using NAND Gates only. F = XY + X(Y+Z) + Y(Y+Z)	4 M
	b	Write the Truth Table for Full Adder and Realize the same using (i) Basic Gates (ii) NAND Gates only.	7 M
	c	For the following Sequential Circuits write the Circuit diagram and Characteristic Table (i) JK Flip Flop (ii) 4-bit Serial Input Serial Output (SISO) shift register (Consider input 1101). (iii) 3 bit Asynchronous up-counter	9 M
4.	a	With a neat diagram explain Input and output V-I characteristics of NPN BJT Common Base Transistor and find the amplification factor for the following Circuit. 	7M
	b	Derive the Expression for Collector Current in terms of β and I_{CEO} and Find the value of I_B, α and β if I_E = 1.2mA and I_C = 1.15mA.	7M
	c	With a neat diagram explain Cellular Communication and describe HAND-OFF strategy.	6 M
5	a	List the Characteristics of Embedded System and discuss the types of embedded systems based on Generation.	6M
	b	Give the differences between Microprocessor and Microcontroller	6M
	c	Draw the Data Flow Model of ARM Processor and explain the same.	8M