UE19EC101#1563#42

SRN

PES University, Bangalore

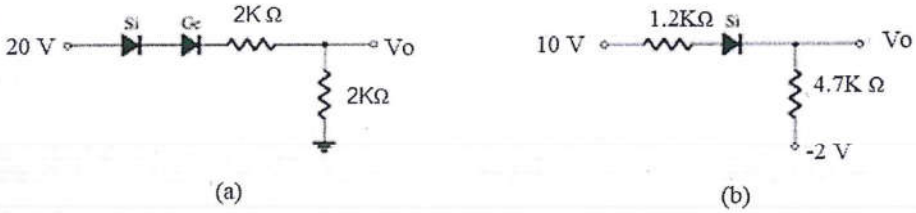
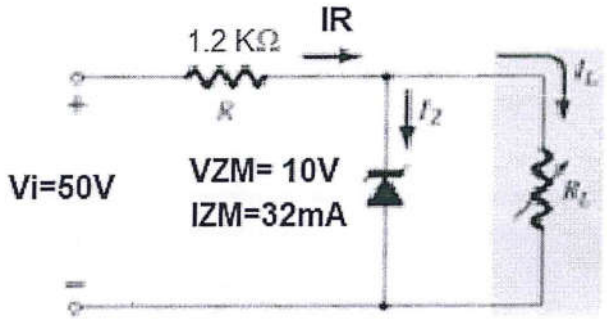
(Established under Karnataka Act No. 16 of 2013)

UE19EC101

DEC 2019: END SEMESTER ASSESSMENT- B.TECH. I SEMESTER

UE19EC101 – Foundation in Electronic Circuits and Systems

Time: 3 hrs | Answer All Questions | Max Marks: 100

1.	a	The Reverse Saturation current of a Si diode is 5×10^{-12} A at a temp of 300K.Find the diode current at (i) 40°C and a forward voltage of 0.7V (ii) 60^0C and a forward voltage of 0.7V. Consider (η=1).	6M
	b	Draw the V-I Characteristics of Semiconductor diode. With the help of the diagram explain three types of Diode Resistance.	6M
	c	Find the Voltage V_o for the series diode configurations circuits shown in the fig (a) and fig (b). 	8M
2.	a	With a neat diagram and the input and output Waveforms Explain the working of half wave rectifier. Derive the expressions for V_{dc} and V_{rms}. Using these values find the ripple factor γ.	7M
	b	Draw full wave Bridge Rectifier circuit with load of 2KΩ. If the AC voltage applied to the ideal diodes has RMS value of 200V.Calculate (i) Average load current (ii) Average load Voltage. (iii) Ripple voltage. (iv) PIV. (v) RMS voltage.	7 M
	c	For the network shown in the Fig., determine the range of R_L and I_L that will result in V_{RL} being maintained at 10 V. 	6M

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3.	a	Simplify the following Expression using Boolean Algebra and realize the same using Basic Gates and NAND gates. (i) $A\bar{B}C + \bar{A}\,BC + A\bar{B}$C+A B $\bar{C}$ (ii) $\overline{(AB + \bar{C})(\bar{A} + \bar{B} + C)}$	8M
	b	Write the Truth table for Full adder and realize the Circuit using (i) NAND Gates. (ii) Two Half Adders	6M
	c	Write the circuit diagram and Truth Table for the following Digital Sequential circuits. (i) JK Flip flop with Nand gates (ii) Four bit Shift Register **(Consider input as 1101 with initial value of the Register is 0000)**	6M
4.	a	Draw and explain the V-I characteristics for the following. Mention the region of operations (i) Output characteristics of Common Emitter Configuration. (ii) Drain Characteristics of n- channel Enhancement MOSFET.	8M
	b	Find α,I_B and β for Transistor with I_C=2.5mA and I_E=2.55mA. Find the value of β if α is increased by 0.002.	4M
	c	Draw the Block diagram of Communication Systems and explain the characteristics of each block. Discuss frequency reuse concept in cellular system for Mobile communication.	8M
5	a	With a neat block diagram explain the functionality of each building block in embedded systems.	6M
	b	List and explain the different types of Memory supported by embedded systems.	4M
	c	Give the differences between Microprocessor and Microcontroller.	3M
	d	Draw and discuss the data flow model of ARM Processor.	7M