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PES University, Bangalore

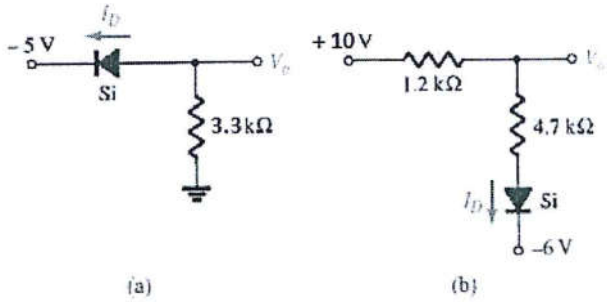
(Established under Karnataka Act No. 16 of 2013)

UE19EC101

Dec 2020: END SEMESTER ASSESSMENT- B.TECH. I SEMESTER

UE19EC101 – Foundation in Electronic Circuits and Systems

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

1.	a)	Explain the different types of Diode Resistance.	6 M
	b)	Determine the thermal voltage for a diode at a temperature of 20°C and also find the diode current if reverse saturation current Is = 30 nA, n= 2, and the applied voltage is 0.5 V.	6M
	c)	Find I_D and Vo for the series diode networks configurations shown below.  (a) (b)	8M
2.	a)	Write the block diagram of regulated power supply and mention the functions of each block.	6 M
	b)	Explain the working of full wave bridge rectifier, With a necessary circuit diagrams and the input and output Waveforms. Obtain the expressions for V_{dc} for both ideal and non-ideal diodes.	8 M
	c)	Design a voltage regulator that will maintain an output voltage of 20 V across a 1 kΩ load with an input that will vary between 30 V and 50 V. And also determine the proper value of source resistance R_S and the maximum Zener diode current I_{ZM}.	6 M
3.	a)	Design Half Adder and Full Adder circuits using NAND gates only.	6 M
	b)	Draw the circuit for 4-bit shift register using D-Flip Flop and Explain the operation by taking 1101 as serial input data.	6 M
	c)	Draw the circuit diagram and truth table for the following flip-flops using NAND gates: (i) J-K Flip Flop (ii) T- Flip Flop	8 M

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4.	a)	Explain Input and output V-I characteristics for common Emitter mode configuration explain the region of operations.	8 M
	b)	Describe the working principle of n-channel Enhancement MOSFET.	6M
	c)	Explain Different types of digital modulation and mention the need for modulation.	6 M
5.	a)	List and Explain main characteristics of Embedded systems?	5 M
	b)	Give the features of ASIC and PLD's.	5 M
	c)	Explain the following Read Only Memory (ROM) devices (i) PROM (ii) EPROM (iii)MROM	5 M
	d)	What are different operating modes of ARM Processor?	5 M