VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY (VSSUT), ODISHA

Even Mid Semester Examination for session 2023-24

COURSE NAME: B.Tech | SEMESTER: 2nd

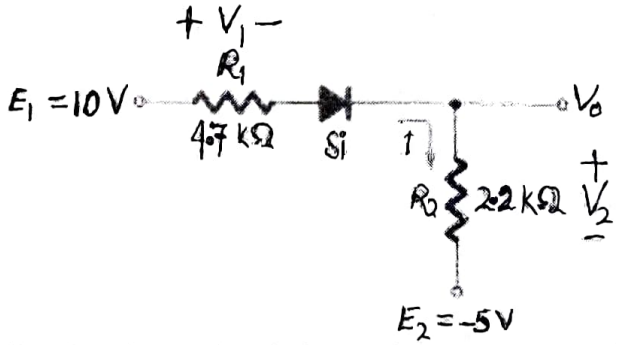
BRANCH NAME: ALL (Sec: D,E,F,G,H,I,J)

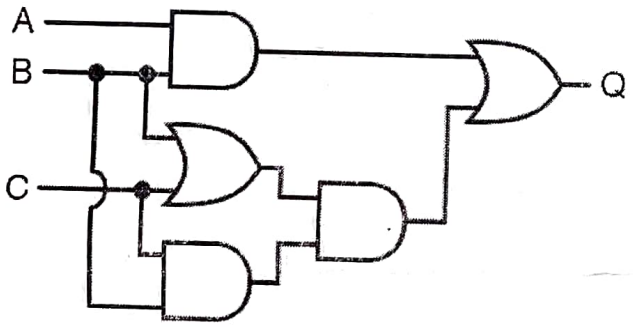
SUBJECT NAME: BASIC ELECTRONICS

FULL MARKS: **30** | TIME: **90 Minutes**

Answer **All** Questions.

The figures in the right hand margin indicate Marks. *Symbols carry usual meaning.*

Q1.		Answer all Questions.	[2 × 3]
	a)	Write the difference between PIV and Knee voltage of a diode.	
	b)	Is BJT a bipolar or unipolar component? Justify.	
	c)	Convert $(2436.672)_8$ into binary and decimal equivalent.	
Q2.			[8]
	(a)	A Si diode a has reverse saturation current of 10 nA at 25 °C. Calculate the current through the diode for a forward bias voltage of 1.2 V. Also compute the static and dynamic resistance of the diode.	[4]
	(b)	Discuss the current flow mechanism in semiconductors.	[4]
		OR	
	(a)	A diode with forward resistance of 50Ω supplies power to a load resistance of 1200 Ω from a 20V rms source. Draw the circuit and calculate: (i) DC output voltage (ii) ripple factor of the diode (iii) PIV ratting of the diode (iv) Efficiency of the circuit.	[4]
	(b)	 For the above circuit determine I, V_1, V_2, and V_o.	[4]
Q3.			[8]
	(a)	Explain the working principle of transistor with neat sketch. Derive the relation between current amplification factor of common base and common emitter configuration.	[4]
	(b)	In a transistor if I_E is 8 mA and I_B is 1/100 of I_C Determine the value of I_B and I_C.	[4]
		OR	

	(a)	Write De-Morgan's theorem and verify by its truth table.	[4]
	(b)	(i) Divide $(1010101)_2$ by $(11)_2$ (ii) $(10110)_2 - (10011)_2$	[4]
Q4.			[8]
	(a)	Perform the following conversion: - (i) $(7483)_{10}$ to hexadecimal. (ii) $(F9A.D5)_{16}$ to decimal. (iii) $(1051.36)_{10}$ to octal. (iv) $(53.625)_{10}$ to binary.	[4]
	(b)	(i) Simplify the following logical equation and draw the logic circuit. $Y = \overline{\overline{(X.\overline{Y} + X.Y.Z)} + X.(Y + X.\overline{Y})}$ (ii) If A=1,B=0 and C=1, find the value of Q for the following logic circuit.  	[4]
		OR	
	(a)	Realize NOT, AND, OR, Ex-OR and Ex-NOR gates using NAND gates only.	[4]
	(b)	Subtract 46 from 99 using 1's and 2's complement methods.	[4]