Reg. No.:

Name :

VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test II – March 2023

Programme	:	**B.Tech (ECE/ECM)**	Semester	:	**WS 2022-23**
Course	:	**Analog Circuits**	Code	:	**BECE206L**
			Class Nbr	:	**CH2022235002479**
Faculty	:	**Dr.Sangeetha R.G**	Slot	:	**F1+TF1**
Time	:	**90 Minutes**	Max. Marks	:	**50**

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks
1.		The transistor parameters for the differential amplifier shown in Figure 1 are $V_{TN} = 0.5$ V, $k_n' = 80\ \mu A/V^2$, $W/L = 4$, and $\lambda = 0$. (a) Find R_D and I_Q such that $I_{D1} = I_{D2} = 80\ \mu A$ and $v_{O2} = 2$ V when $v_1 = v_2 = 0$. (b) Draw the dc load line, and plot the Q point for M_2. (c) What is the maximum common-mode input voltage?	15

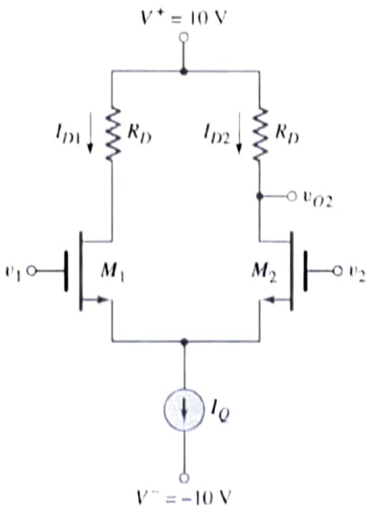


Figure 1

2.		Find an expression for the output V_o of the amplifier circuit of Figure 2. Assume an ideal op-amp. What mathematical operation does the circuit perform?	10

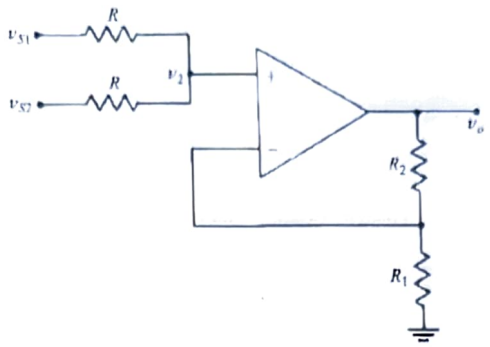
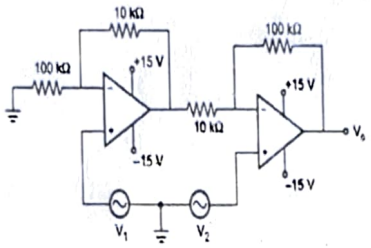


Figure 2

3.	Calculate the output voltage in terms input voltages V_1 and V_2 for the circuit shown below  Figure 3	10
4.	The following component values are used in the circuit of op-amp astable multivibrator C= 0.1 μF, R = 50 kΩ, R1 = 10 kΩ, R2 =50 kΩ. The output voltage is bounded to the limits +10 V and -5 V. Calculate the timing periods t_1 and t_2.	10
5	Design a square wave generator for f= 1kHz and DC supply voltage ±12V.	5
	Total	50

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