
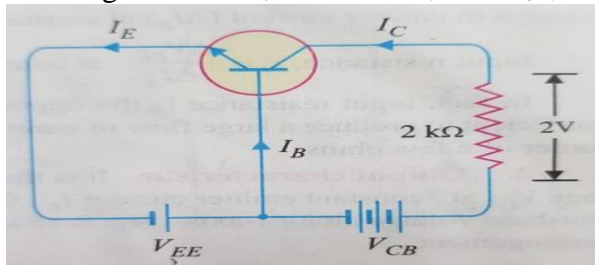
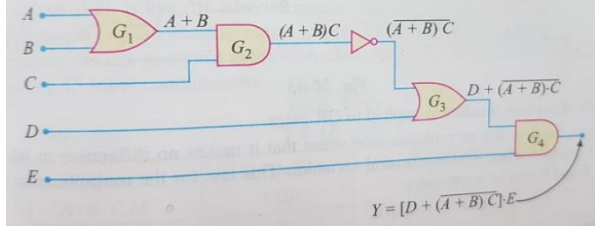


Name: Enrolment No:	
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UPES
End Semester Examination, May 2024

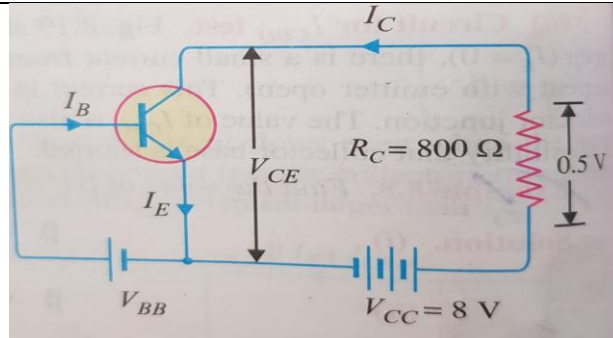
Course: Electronics Program: B.Sc. (Chemistry by Research) Course Code: ECEG4046 Instructions: (i) All questions are compulsory. (ii) Use of Scientific calculator is allowed.	Semester: VIII Time : 03 hrs. Max. Marks: 100
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SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	An a.c. voltage of peak value of 20V is connected in series with a Si diode and load resistance of 500 Ω. If the forward resistance of diode is 10 Ω calculate: (i) peak input voltage, (ii) peak output voltage.	5	CO1
Q 2	For the given circuit; determine I_c and V_{CB} . 	5	CO2
Q 3	 Derive and examine the Boolean expression for given circuit.	5	CO3
Q 4	An EM wave is represented by $V = 5(1+0.6\cos 6280 t) \sin 211 \times 10^4 t$ volts. What is the maximum and minimum amplitude of wave? What frequency components are contained in the modulated wave?	5	CO4

SECTION B
(4Qx10M= 40 Marks)

Q 5	Construct a block diagram of a filter circuit and write its uses? Evaluate the ripple factors for: (i) Choke filter and (ii) Capacitor filter.	10	CO1
Q 6	A transistor is connected in common emitter mode as shown in figure. The collector circuit supply is of 8V and the voltage drop across resistance R_c is 0.5 V. The value of R_c is given in figure. If $\alpha = 0.96$ determine: (i) collector-emitter voltage and (ii) base-current.	10	CO2



Q 7	Illustrate the encoder and decoder circuits with block diagrams. Perform logical operations, by explaining the principle, working and applications of (i) encoders and (ii) decoders.	10	CO3
Q 8	Derive the mathematical expression for the amplitude modulation of a wave and, hence, define the upper sideband and lower side band frequency.	10	CO4
SECTION-C (2Qx20M=40 Marks)			
Q 9	Calculate the sum of any two and three binary digits for an operation of Binary adders. Illustrate the principle and working of: (i) half and (ii) full adders.	20	CO3
Q 10	What is the phenomenon of modulation? Assume an EM wave and apply the theory of modulation and, hence, estimate modulation-index of the EM wave.	20	CO2