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B033413(033)

B. Tech. (Fourth Semester) Examination
April-May 2022

(AICTE Scheme)

(IT Branch)

ANALOG ELECTRONIC CIRCUITS

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Part (a) is compulsory from each unit. Attempt any* ***two*** *parts from (b), (c) and (d) to each unit. Part (a) is of 4 marks and part (b), (c) and (d) has 8 marks.*

Unit-I

1. (a) Write diode current equation and explain each term.

   (b) Show that I_0 increases by 11% per degree rise temperature for Germanium.

(c) Derive the expression for DC current, RMS current, DC power, AC power, Efficiency, Ripple factor for Half Wave Rectifier.

(d) Write the short note on Zener Breakdown and Avalanche Breakdown.

Unit-II

2. (a) Why an ordinary junction transistor is called bipolar?

(b) Draw and explain the characteristics of common-emitter configuration of transistor.

(c) Explain early effect in transistor with suitable diagram.

(d) Draw and explain the Ebers-Moll model of a transistor.

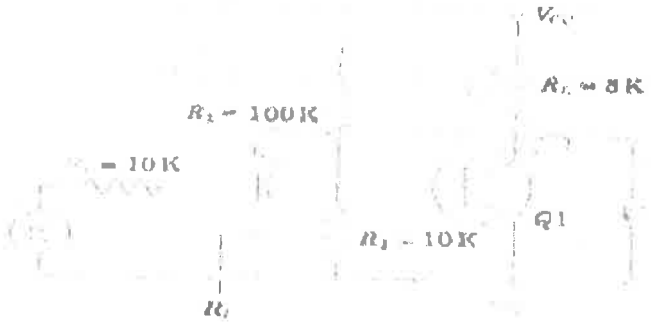
Unit-III

3. (a) What is the requirement of h-parameter models?

(b) Derive the expression for CE short circuit current gain A_i as a function of frequency.

(c) Derie an expression for A_i, R_i A_v and R_0 using exact analysis.

(d) For the circuit shown, calculate $A_i = I_0/I_i$, A_v, A_{vs}, R_i and R_0. Transistor h parameter are as follows h_{ic} = 1.1 K, $h_{re} = 2.5\times10^{-4}$, h_{fe} = 50, h_{oc} = 25 μ A/V .



Unit-IV

4. (a) What do you mean by Fidelity of an amplifer?

(b) Draw the two stage RC coupled amplifiers and explain its response in LF and HF.

(c) Explain Noise Figure and show the procedure for measurement of noise figure.

(d) Explain magnitude bode plot of a 2-pole transfer function.

Unit-V

5. (a) Differential between positive and negative feedback.

   (b) Explain Barkhausen Criterion and condition of oscillation.

   (c) Discuss feedback amplifier topologies.

   (d) Draw a circuit crystal controlled oscillator. Explain its working principle in details.