CBCS SCHEME

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18EE34

Third Semester B.E. Degree Examination, Jan./Feb. 2021
Analog Electronic Circuits

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. What is bias stabilization? Explain with help of load line the effect of variation of V_{CC}, I_B, on Q-point of a transistor. **(10 Marks)**

b. For the emitter bias network shown in Fig Q1(b)

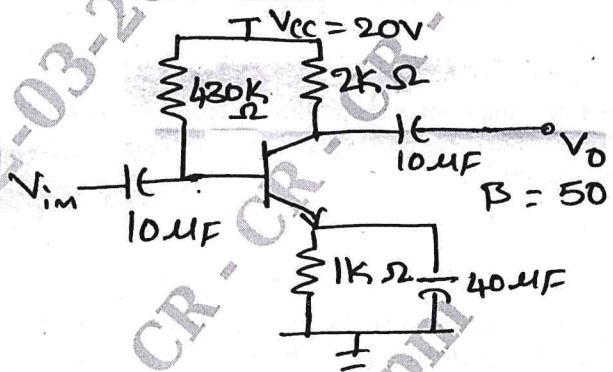

Fig Q1(b)

Determine following : i) I_B ii) I_C iii) V_{CE} iv) V_C v) V_E. **(10 Marks)**

OR

2 a. With circuit diagram and explain the voltage divider Biasing circuit. Also derive the I_B and V_{CE}. **(10 Marks)**

b. Draw and explain the double ended diode clipper circuit. **(05 Marks)**

c. Draw a simple +ve damper circuit and explain its operation. **(05 Marks)**

Module-2

3 a. State and prove miller's theorem. **(06 Marks)**

b. Compare the characteristics of CE, CC, CB configuration. **(04 Marks)**

c. Derive the expression for A_V, Z_i and Z_o of the voltage divider bias circuit using hybrid model. **(10 Marks)**

OR

4 a. Starting from the fundamentals, define h-parameters and obtain h-parameter equivalent circuit of common emitter configuration. **(10 Marks)**

b. Transistor used in RC coupled CE amplifiers with fixed bias has h_{ie} = 1kΩ, h_{fe} = 60, h_{ve} = 15μA/V, $h_{re} = 2 \times 10^{-4}$, circuit has R_s = 1kΩ, R_B = 56kΩ, R_C = 10kΩ and R_L = 10kΩ. Find A_I, A_{IS}, Z_{in} and Z_o. **(10 Marks)**

Module-3

5 a. Explain the operation of cascade connections with the help of neat diagram. **(10 Marks)**

b. Draw the circuit of Darlington emitter follower with voltage divider bias calculate input impedance, voltage gain and output impedance. Take $\beta_1 = \beta_2 = 100$, $R_1 = R_2 = 100k\Omega$, $R_E = 5k\Omega$, Take $r_e = 0.1k\Omega$. **(10 Marks)**

OR

6 a. What are the advantages of negative feedback in amplifiers? **(06 Marks)**

b. Draw the block diagram and explain the concept of feedback. **(04 Marks)**

c. Derive an expression for Z_i and A_i for a Darlington emitter follower circuits. **(10 Marks)**

Module-4

7 a. With a neat diagram, explain the different types of power amplifiers. **(10 Marks)**

b. With a circuit diagram, explain the transformer coupled class A amplifier. Also derive the expression R'_L. **(10 Marks)**

OR

8 a. With a neat diagram, explain the wein bridge oscillator circuits. **(10 Marks)**

b. In a Hartley oscillator $L_1 = 20\mu H$, $L_2 = 2mH$ and C is variable. Find the range of C if frequency is to be varied from 1MHz to 2.5MHz. Neglect mutual inductance. **(08 Marks)**

c. Comparison between RC phase shift and wein bridge oscillator. **(02 Marks)**

Module-5

9 a. With a neat diagram, explain the construction of n-channel JFET. **(10 Marks)**

b. Derive an expression for saturation drain current of n-channel JFET. **(10 Marks)**

OR

10 a. Mention the different between BJT and FET. **(06 Marks)**

b. A JFET has $g_m = 6mV$ at $V_{GS} = -1V$. Find I_{DSS} if pinch-off voltage $V_P = -2.5V$. **(04 Marks)**

c. Explain construction, working and characteristics of n-channel depletion type MOSFET. **(10 Marks)**

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