

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)

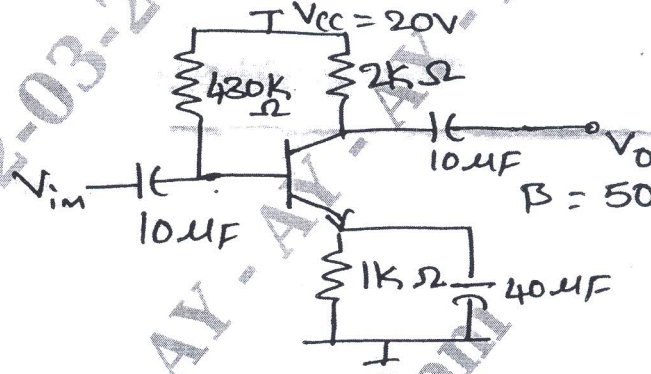


Fig Q1(b)

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 $h_{ie} = 1k\Omega$, $h_{fe} = 60$, $h_{ve} = 15\mu A/V$, $h_{re} = 2 \times 10^{-4}$, circuit has $R_s = 1k\Omega$, $R_B = 56k\Omega$, $R_C = 10k\Omega$ and $R_L = 10k\Omega$. Find A_I , A_{IS} , Z_{in} and Z_o . (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

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_v 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)
