CBCS SCHEME

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18EE34

Third Semester B.E. Degree Examination, June/July 2023
Analog Electronic Circuit

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define Q or Operating point **(02 Marks)**

b. What is a clipper circuit? Explain the working of a double ended clipper with a suitable diagram. **(08 Marks)**

c. List various types of clamper circuit. With a neat circuit diagram, explain the working of a negative clamper. **(10 Marks)**

OR

2 a. Discuss emitter stablized bias circuit. Also derive expression for I_B, I_C, V_B and V_c. **(10 Marks)**

b. Determine the following for the fixed bias configuration of Fig.2(b). Assume β=50.
(i) I_{BQ} and I_{CQ} (ii)V_{CEQ} (iii)V_B and V_C (iv)V_{BC}

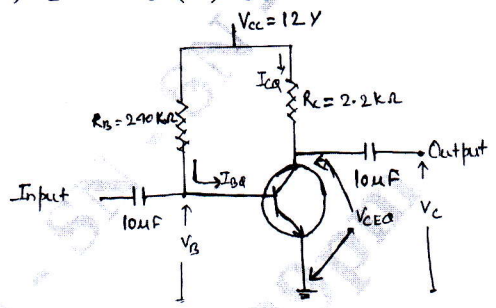

Fig.Q.2(b) **(10 Marks)**

Module-2

3 a. Derive an expression for A_y , Zi and Zo of CE voltage divider bias circuit using hybrid model. **(10 Marks)**

b. For the collector feedback configuration of Fig 3(b), calculate (i) r_e (ii) Zi and Zo (iii) A_y and A_I Consider β=200, r_o=60Kr.

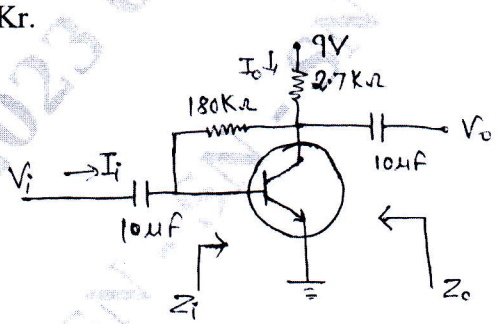

Fig.3(b)

(10 Marks)

OR

4 a. For the network of fig 4(a), determine: (i) r_e (ii) Z_i (iii) Z_o (r_o =oo) (iv) A_v ($r_o = \infty$) **(10 Marks)**

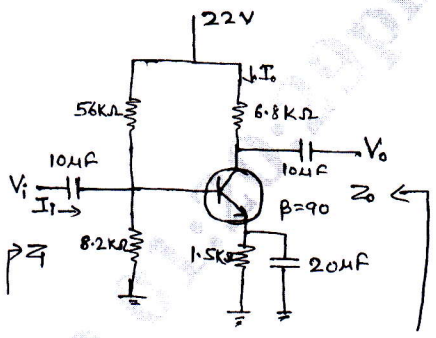

Fig.4(a)

b. Why hybrid model is called as hybrid? Obtain h – parameters from equivalent circuit of common – emitter configuration. **(10 Marks)**

Module-3

5 a. Define Multistage Amplifier. Derive voltage gain and current gain of a two stage cascaded amplifier. **(10 Marks)**

b. Derive an expression for Zi and Ai for Darlington Emitter follower circuit. **(10 Marks)**

OR

6 a. Find out input and output impedance of a current series feedback amplifier. **(10 Marks)**

b. Determine the voltage gain, input and output impedance with feedback for voltage series feedback having A = -100 , Ri = 10 kΩ , R_0 = 20 kΩ for feedback of i) β = -0.1 and ii) β = -0.5. **(10 Marks)**

Module-4

7 a. With a neat circuit diagram, explain the AC Operation of series – fed class – A amplifier. Also derive maximum efficiency of the amplifier. **(10 Marks)**

b. Show that maximum efficiency of Class – B push pull power amplifier is 78.54%. **(10 Marks)**

OR

8 a. Explain the working of R.C phase shift oscillator. If R = 1 kΩ , R_c = 1 kΩ and C = 0.1μf, Calculate the frequency of oscillations. **(10 Marks)**

b. Discuss the working of Wein Bridge Oscillator, with a suitable diagram. **(10 Marks)**

Module-5

9 a. Describe the working and characteristics of M – Channel JFET. **(10 Marks)**

b. For a self – bias circuit, V_{DD} = + 20 , R_D = 3.3 kΩ , R_G = 1 MΩ , R_S = 1 kΩ , I_{DSS} = 8mA and V_P = - 6V. Determine i) V_{GS} ii) I_D iii) V_{DS} iv) V_S v) V_G vi) V_D. **(10 Marks)**

OR

10 a. With a neat structure, explain the operation of an n – channel depletion type MOSFET. **(10 Marks)**

b. Compare JFET with MOSFET. Sketch the transfer characteristics for an N – channel depletion type MOSFET with I_{DSS} = 10mA and V_P = - 4V. **(10 Marks)**

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