

- 4 a. Explain low frequency response of BJT amplifier. Derive the expression for lower cut-off frequency considering the effect of input coupling capacitor C_S . (10 Marks)
- b. For the circuit shown in Fig. Q4 (b). Calculate (i) f_{Hi} and f_{Ho} . (ii) f_β and f_T
 Take $C_{be} = 35$ P.F, $C_{bc} = 5$ P.F, $C_{ce} = 1$ PF, $C_{wi} = 6$ PF, $C_{wo} = 10$ P.F, $\beta = 100$ and $V_0 = \infty$. (10 Marks)

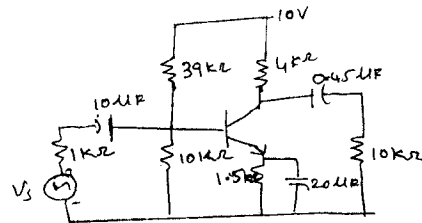


Fig. Q4 (b)

PART - B

- 5 a. Explain Darlington emitter follower. Draw the equivalent circuit. Derive expression for input impedance (Z_I), current gain (A_I), Voltage gain A_V and output impedance (Z_O). (10 Marks)
- b. Determine the voltage gain, input and output impedance with voltage series feedback having $A = -100$, $R_i = 10$ KΩ, $R_o = 20$ KΩ for feedback factor $\beta = -0.1$. (06 Marks)
- c. Discuss the advantages of negative feedback. (04 Marks)
- 6 a. Describe FET amplifier with voltage series feedback. Derive the expression for gain. (10 Marks)
- b. Explain the principles of class B amplifier operation. Derive expression for
 (i) input dc power (ii) Output ac power (iii) η -efficiency
 (iv) power dissipated by output transistor. (10 Marks)
- 7 a. Write the basic principle of oscillator. Also state the conditions for oscillation. (04 Marks)
- b. Describe any one type of tuned oscillator with relevant diagram. Write expression for frequency of oscillations. (08 Marks)
- c. RC phase shift oscillator $R_c = 5$ kΩ and $R = 3.3$ kΩ. Find the range of values of capacitor if it is required to vary frequency from 100 Hz to 20 kHz. (08 Marks)
- 8 a. Explain common gate JFET configuration with relevant circuit diagram. Draw equivalent circuit. Derive expression for Z_i , Z_o and A_V . (08 Marks)
- b. The self biased configuration of JFET has operating point defined by $V_{GSQ} = -2.6$ V and $I_{DQ} = 22.6$ mA and $I_{DSS} = 8$ mA and $V_p = -6$ V the value of $Y_{OS} = 20$ μS as shown in Fig.Q8 (b). Find (i) g_m (ii) r_d (iii) Z_i (iv) Z_o (06 Marks)

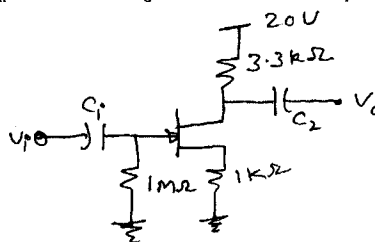


Fig. Q8 (b)

- c. Differentiate depletion type MOSFET and enhancement type MOSFET. (06 Marks)
