

For the Darlington amplifier circuit shown below, find the base current of Q_1 , overall current gain, and also its input resistance. (05 Marks)

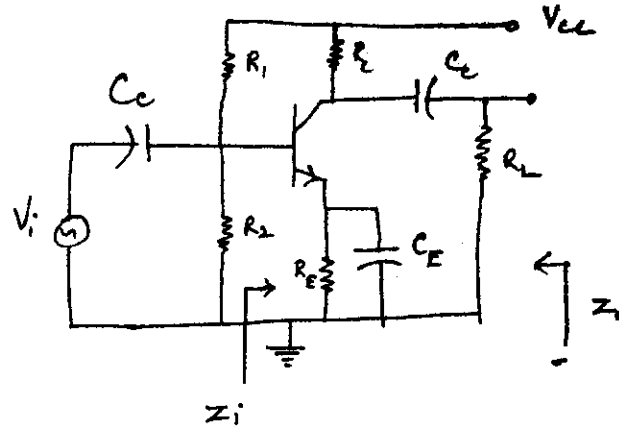


Fig. Q3(c)

- 4 a. What are power amplifiers? Give the graphical representations of the classes of power amplifiers. (10 Marks)
- b. Explain the working of a class B pushpull amplifier. What is maximum conversion η ? (06 Marks)
- c. Find the Bandwidth of class 'C' amplifier. If the tuning circuit components are 470 pF and 2 μ H and the quality factors of the circuit is 100. (04 Marks)

PART - B

- 5 a. Define the following terms of a MOSFET. i) I_{DSS} ii) $V_{GS(off)}$ iii) V_T . (06 Marks)
- b. With a net diagram and characteristics, explain the working of a n channel enhancement mode MOSFET. (06 Marks)
- c. Draw the circuit of a CMOS inverter and explain its working. Find the output voltage of the inverter. If $V_{DD} = 20$ V, $R_{D(ON)} = 6$ Ω , for an input pulse varying from 0 - 10 V. sketch waveforms. (08 Marks)
- 6 a. Define the following terms of an amplifier
i) Frequency response ii) Cut off frequencies iii) Band width. (06 Marks)
- b. For an AC amplifier circuit shown below, if the midband voltage gain is 250, $F_L = 25$ Hz, $F_H = 200$ KHz. Draw its frequency response. Also find the gain of the amplifier at 10 Hz and 900 KHz. (04 Marks)

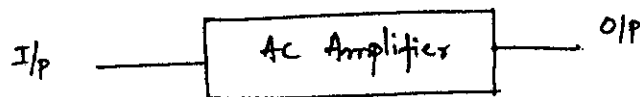


Fig. Q6(b)

- c. Explain the four types of negative feedback amplifiers. (10 Marks)
- 7 a. Explain the working of an inverting schmitt trigger and give the expressions for UTP and LTP. (06 Marks)
- b. Design an opamp relaxation oscillator to generate a square wave of 2 KHz and duty cycle 0.5. Draw output and capacitor waveform. Take $\beta = 0.5$. (08 Marks)
- c. Explain the working of astable multivibrator using IC555, with a neat circuit diagram and internal diagram. (06 Marks)
- 8 a. Define load regulation, line regulation and output resistance of a regulator. Calculate % regulation if $V_{NL} = 9.91$ V and $V_{FL} = 9.79$ V. (08 Marks)
- b. Draw circuit diagram of zener and two transistor discrete series regulator and derive equations for output voltage. (12 Marks)
