

B.Tech. - VIEP - ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination
June, 2017

00514

BIEL-005 : ANALOG ELECTRONIC CIRCUITS

Time : 3 hours

Maximum Marks : 70

Note : Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted. Missing data, if any, may be suitably assumed.

1. For the network shown in Figure 1, determine :

$$4 \times 2 \frac{1}{2} = 10$$

- (a) r_e
- (b) Z_i
- (c) Z_o ($r_o = \infty \Omega$)
- (d) A_v ($r_o = \infty \Omega$)

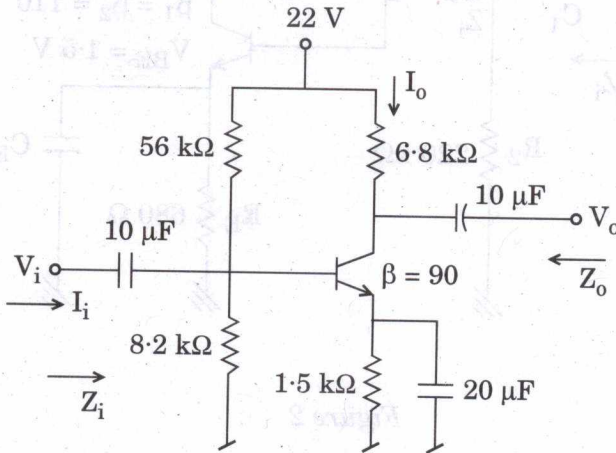


Figure 1

2. Calculate the following for the Darlington configuration in Figure 2 :

$$4 \times 2 \frac{1}{2} = 10$$

- (a) Input impedance
- (b) Current gain
- (c) Voltage gain
- (d) Output impedance

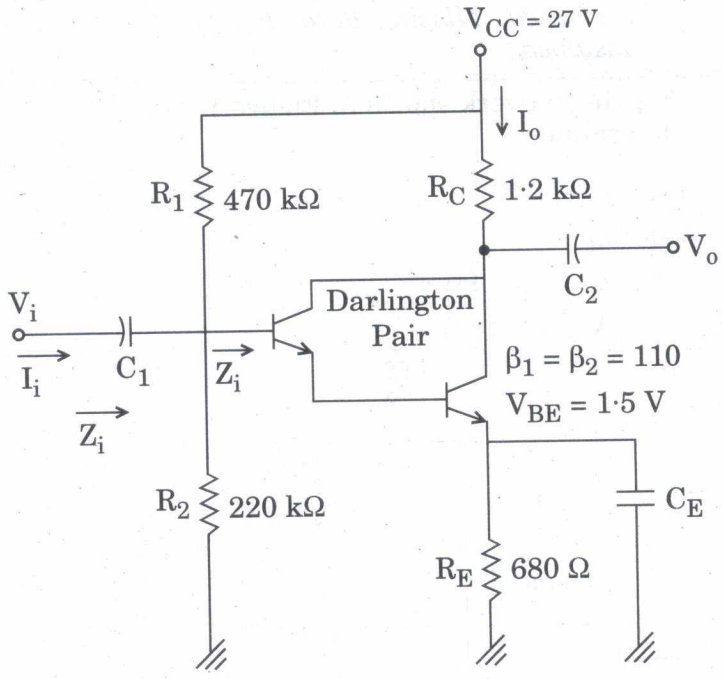


Figure 2

3. (a) Explain Multistage Frequency Effects. Assuming 'n' identical stages of amplifiers cascaded together, show that for the low-frequency region and the high-frequency region, the cut-off frequency of the multistage amplifier is given respectively by the expressions given below : 7

- Low-frequency region

$$f_1' = \frac{f_1}{\sqrt{2^{1/n} - 1}}$$

- High-frequency region

$$f_2' = f_2 \left(\sqrt{2^{1/n} - 1} \right)$$

- (b) What is the purpose of emitter bypass and coupling capacitor in RC coupled amplifier circuit ? 3

4. (a) Explain the operation of Class-A Transformer Coupled Amplifier with the help of a neatly labelled block diagram. 5

- (b) Prove that the maximum efficiency of a Class-B amplifier is 78.5%. 5

5. What are tuned amplifiers and where are they used ? Also discuss the circuit operation of a single tuned amplifier and its advantages. 10

6. (a) Explain Current shunt and Voltage shunt feedback amplifiers with neatly labelled diagram. 7
- (b) The voltage gain of an amplifier without feedback is 60 dB. It decreases to 40 dB with feedback. Calculate the feedback factor. 3
7. Give the circuit diagram of a crystal-controlled oscillator using a crystal in series-feedback path. Derive an expression for its input impedance and the frequency of oscillations. $3+7=10$
8. Draw the Pin Configuration of IC-555 timer. Write the applications and function of each pin of IC. 10
9. Explain the differences among monostable, astable and bistable multivibrators. 10
10. Write short notes on any *two* of the following : $2 \times 5 = 10$
- (a) Wein Bridge Oscillator
- (b) Voltage-Series Feedback
- (c) Double Tuned Amplifiers
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