

**B.Tech. IN ELECTRONICS AND  
COMMUNICATION ENGINEERING (BTECVI)**

**Term-End Examination**

**June, 2012**

**BIEL-005 : ANALOG ELECTRONIC CIRCUITS**

*Time : 3 Hours*

*Maximum Marks : 70*

*Note : Attempt any seven questions. All questions carry equal marks.*

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1. For the network of fig. 1

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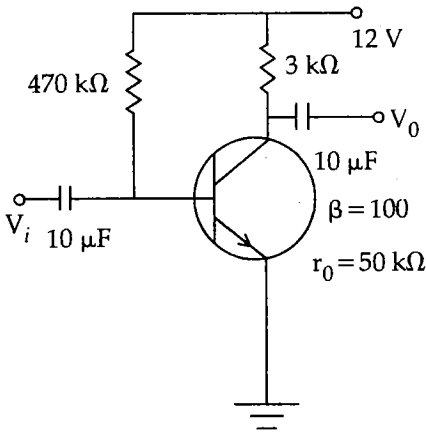


Fig. 1

- (a) Determine  $r_e$ .
- (b) Find  $Z_i$  (with  $r_o = \infty \Omega$ )
- (c) Calculate  $Z_o$  (with  $r_o = \infty \Omega$ )
- (d) Determine  $A_v$  (with  $r_o = \infty \Omega$ )
- (e) Find  $A_i$  (with  $r_o = \infty \Omega$ )

2. Draw and explain the Darlington connection. 10  
What is the main advantage of it. Also calculate the current gain provided by Darlington connection of two identical transistor each having a current gain of  $\beta = 200$ .
3. Draw and explain the high - frequency transistor 10  
small - signal ac equivalent circuit of a BJT. Also derive the formula for gain - bandwidth product ( $F_T$ ):
4. Compare the class A, B, AB and C amplifiers. 10  
Draw and explain the complementary - symmetry push - pull circuit and also show that which type of distortion occurs in it.
5. Write the behaviour of tuned amplifiers. Explain 10  
the series and parallel resonant circuit. Also write the advantages of tuned amplifiers.
6. What are the advantages of negative feedback. 10  
Draw the connection diagram of all four feedback topology.
7. Determine the voltage gain, i/p and o/p 10  
impedance with feedback for voltage series feedback having  $A = -100$ ,  $R_i = 10\text{k}\Omega$ ,  $R_o = 20\text{k}\Omega$  for feedback of
  - (a)  $\beta = -0.1$
  - (b)  $\beta = -0.5$

8. What is the Barkhausen criteria of oscillation ? 10  
Explain the Wien Bridge oscillator. Also calculate the frequency of oscillations of a Hartley oscillator having  $L_1 = 0.5\text{mH}$ ,  $L_2 = 1\text{mH}$  and  $C_3 = 0.2\mu\text{F}$ .
9. Define Monostable, Astable and Bistable 10  
multivibrator. Also explain the operation of 555 timer with the sketch of diagram.
10. Write short notes on *any two* : 5x2=10
- (a) Single tuned Amplifiers
  - (b) Cascade Amplifiers
  - (c) Equivalent circuit of BJT using h-parameters.
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