PVP 14

Code: EC4T3

II B.Tech - II Semester – Regular/Supplementary Examinations – April 2017

ANALOG ELECTRONIC CIRCUITS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22

1.

a) Why h-parameters are suitable to model a transistor?
b) Compare CC amplifier with CE amplifier.
c) Draw the high frequency CE model of transistor.
d) Explain the significance of gain bandwidth product.
e) Draw the small signal model of a CS amplifier.
f) Explain the need of cascading amplifiers.
g) State Miller’s and duality of Miller’s theorem.
h) Draw the practical circuit for voltage shunt feedback amplifier.
i) What are the general characteristics of negative feedback amplifiers?
j) List the advantages of crystal oscillator.
k) What is crossover distortion and how it can be eliminated?

PART – B

Answer any ***THREE*** questions.   All questions carry equal marks.

3 x 16 = 48 M

2. a) Compare the characteristics of transistor amplifiers in the three configurations. 6 M

   b) Consider a single stage CE amplifier with R_s=1KΩ, R_1=50KΩ, R_2=2KΩ, R_c=2KΩ, R_L=2KΩ, h_{fe}=50, h_{ie}=1.1K, h_{oe}=25μA/V and h_{re}=2.5x10^{-4} as shown in figure 1. Find A_i, R_i, A_v, A_i, A_{vs} and R_o . Assume that C_1, C_2 and C_e are large at the operating frequency range. 10 M

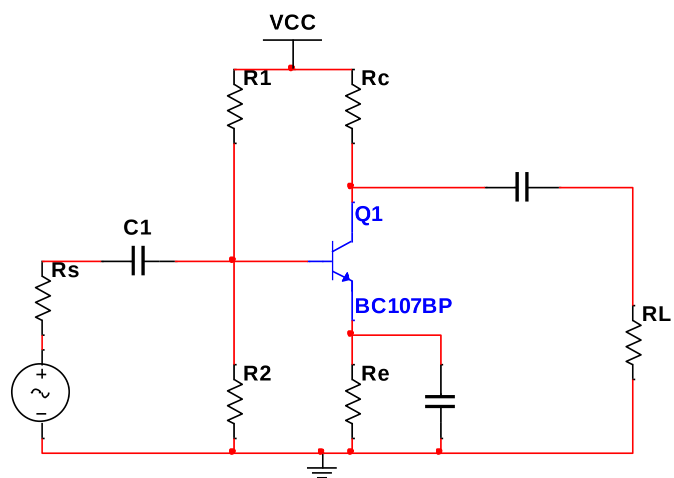

Figure 1

3. A transistor ‘s short circuit current gain is measured to be 25 at a frequency of 2 MHz. If the transistor’s f_β=200 kHz Determine :

   a) The current gain bandwidth product, f_T 5 M

   b) The transistor h_{fe} at low frequency. 5 M

c) The short circuit current gain at 10 MHz and 100 MHz. 6 M

4. a) Explain different coupling schemes used in multistage amplifiers with their frequency response. 8 M

b) Derive the expressions for A_i, R_i, A_v and R_o of bootstrapped Darlington pair. 8 M

5. a) For the voltage series feedback amplifier, derive the expression for gain, input resistance and output resistance. 10 M

b) Calculate the gain, input impedance, output impedance of voltage series feedback amplifier having $A=-300$, $R_i=1.5K$, $R_o=50K$ and $\beta=-1/20$. 6 M

6. a) Draw and Explain the working of Hartley oscillator. 8 M

b) Explain transformer coupled class A amplifier and find its efficiency. 8 M