14/5/19 (5)

Exam.Code:0906
Sub. Code: 7032

1059

B.E. (Civil Engineering)
Second Semester
EC-201: Analog Electronic Circuits – I

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Answer of the following:-

a) Why is thermal stability in a transistor necessary? (2)

b) What is the need for bias stabilization in Transistor Biasing? (2)

c) Why are non-sinusoidal oscillators referred to as relaxation oscillators? (2)

d) State the Barkhausen criterion, i.e., the conditions necessary for sinusoidal oscillations to be sustained. (1)

e) What is heat sink? (1)

f) Why transistor is called current controlled device? (1)

g) What is distortion in power amplifiers? (1)

UNIT – I

II. a) Explain the input and output characteristics of a transistor in CE configuration with reference to early effect.

b) Calculate I_c and I_E for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100\ \mu A$. Find the value of β_{dc} of the transistor. (6,4)

III. a) Obtain an expression in terms of 'h' parameters for a transistor as a two port network. Using the above developed equations obtain the hybrid model of CE, CC, and CB configuration.

b) A transistor is connected as a common emitter amplifier driving a load of 10 kΩ. It is supplied by a source of 1 kΩ internal resistance. The 'h' parameter are h_{ie}=1.1 kΩ, $h_{ie} = 50$, $h_{re} = 2.5 \times 10^{-4}$, h_{oe} = 1/40 kΩ. Find (i) current gain, (ii) Voltage gain, (iii) input impedance, (iv) output impedance. (5,5)

IV. a) What is meant by a Field Effect Transistor? Explain its biasing process.

b) Explain FET small signal model and list FET applications. (5,5)

P.T.O.

UNIT – II

V. a) What is an Transformer coupled amplifier? Explain its working with the help of suitable diagram.

b) What is meant by bandwidth of an amplifier? What is its significance and how do you determine it in case of amplifier? (5,5)

VI. a) With the help of relevant circuit diagram, describe the operation of Phase Shift Oscillator. What are the phase shifts introduced by the feedback and amplifier parts?

b) What are Crystal oscillators? What makes crystal oscillators exhibit exceptionally high frequency stability? (5,5)

VII. a) What are Single tuned and double tuned amplifiers? What are the drawbacks of a single tuned amplifier?

b) What is Push Pull amplifier? Explain the functioning of a Class B push-pull power amplifier with necessary circuit diagram. (5,5)

x-x-x