Exam. Code: 0927
Sub. Code: 6896

1129

B.E. (Electronics and Communication Engineering)
Third Semester
EC-307: Electronic Devices and Circuits

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. Use of scientific calculator is allowed.

x-x-x

I. Answer the following:-

a) What is Fermi level?

b) What is the frequency of oscillation of a Wein bridge oscillator?

c) In which region n-channel E-MOSFET will operate, if V_{GS} = 5V, V_{T0} = IV and V_{DS} = 4V?

d) Discuss the importance of class AB amplifiers along with their applications.

e) What is the voltage gain of dual input balanced output differential amplifier? (5x2)

UNIT – I

II. a) For any transistor amplifier, prove that R; = $(h_i/(1 - h_r A_y))$.

b) Draw the voltage divider bias circuit and also find the expressions for operating point in terms of circuit parameters like Ic, V_{CE} and I_B ? (2x5)

III. a) Define stability factor. Explain with circuit diagram of potential divider method of biasing in transistors.

b) A transistor connected in CE configuration has the following h-parameters h_{je} = 2000Ω; h_{re} = 1.6 x 10^{-4}; h_{fe} = 50; h_{oe} = 50μ A/V. Determine:
i) Input resistance
ii) current gain
iii) voltage gain The load resistance is 12k Ω and source resistance is 500 Ω. (2x5)

IV. a) Define stability factor. Explain with circuit diagram of potential divider method of biasing in transistors.

b) Sketch and explain the CE output characteristic of NPN transistor. (2x5)

P.T.O.

UNIT – II

V. a) Draw the circuit diagram of a push-pull amplifier. Explain its operation. Discuss advantages and disadvantages.

b) Draw the circuit of a common source FET amplifier. With the help of small signal equivalent circuit, analyze the amplifier for voltage gain and input admittance. (2x5)

VI. a) Explain the principle of working of transistor Colpitts oscillator. Draw circuit diagram and briefly function of each component.

b) Discuss the effect of emitter by-pass capacitor and shunt capacitor on frequency response of an amplifier. (2x5)

VII. An amplifier with a negative feedback provides an output voltage of 5V with an input voltage of 0.2V. On removal of feedback, it needs only 0.1V input to give the same output. Find the following.

a) Gain without feedback

b) Gain with feedback

c) Feedback ratio (10)

x-x-x