Exam.Code:0906
Sub. Code: 7032

1019
B.E. (Electronics and Communication 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. Attempt the following:-

a) Which transistor configurations are capable of providing both voltage and current gains?

b) Why is the transistor referred to as a bipolar junction device?

c) What happens to the h-parameters when the junction temperature of a transistor increases?

d) What are the advantages of JFETs over BJTs?

e) Mention two differences between JFETs and MOSFETs.

f) What is the need for cascading amplifiers?

g) What is the condition that decides the oscillator's output frequency?

h) Which is the most popular oscillator configuration for audio applications?

i) Why are heat sinks used in power transistors?

j) What are class C amplifiers? (10x1)

UNIT – I

II. a) Explain the principle of operation of a PNP transistor in the active region.
b) Compare the common-base, common-emitter and common-collector configurations of a transistor. (5,5)

III. a) Derive the mathematical expression to prove that the operating point in voltage-divider bias configuration is independent of transistor gain B.

b) Derive the expression for the stability factor $S(I_{co})$ tor fixed-bias configuration. (5,5)

IV. a) How can we determine the h-parameters of a transistor using its input and output characteristic curves?

b) With the help of neat diagram, describe the operation of N-channel depletion MOSFETs. (5,5)

P.T.O.

UNIT – II

V. a) Explain the effect of coupling and bypass capacitors on the low-frequency response of the transistor-based amplifier.

b) What are cascode amplifiers? What are the advantages offered by the cascode amplifiers? (5,5)

VI. a) How does the circuit configuration of an oscillator differ from that of an amplifier? What are the different constituents of an oscillator circuit?

b) With the help of a basic circuit diagram, briefly describe the operation of a Colpitfs oscillator. (5,5)

VII. a) Derive an expression to prove that the maximum efficiency in the case of a class B amplifier is 78.5%. What assumptions are made in calculating the maximum theoretical efficiency?

b) What are the advantages offered by class A transformer-coupled amplifier over a direct-coupled class A amplifier? (5,5)

x-x-x