2054

B.E. (Electronics and Communication Engineering)
Fourth Semester
EC-406: Analog Electronic Circuits

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt* <u>*five*</u> *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) Differentiate between a single stage and multistage amplifier.

    b) Differentiate between common mode gain and differential mode gain of an operational amplifier.

    c) Discuss the merits and demerits of a crystal oscillator.

    d) Explain the concept of virtual ground.

    e) What is a current mirror? What are its applications in analog circuits?   (5x2)

UNIT - I

II.   a) Explain why the transistor gain varies with high frequency in an amplifier?

    b) What are the coupling methods in cascading two amplifiers? What is a basic difference between cascading and cascoding? Give examples.   (5,5)

III. a) Draw and explain all the stages of an operational amplifier. Give four characteristics of an ideal operational amplifier.

    b) What is a single input an dual output differential amplifier? Differentiate between passive load and current mirror load differential amplifier.   (5,5)

IV.   a) What is negative feedback in an amplifier? Derive the expression for a negative feedback amplifier. What are the types of negative feedback?

    b) Differentiate between miller theorem and Norton theorem in an amplifier.   (5,5)

P.T.O.

UNIT - II

V. a) Explain the working of a logarithmic operation using an operational amplifier.

b) Discuss how a logarithmic amplifier is different to an anti logarithmic amplifier?

c) Design a circuit which can evaluate the expression $(v_1+v_2)^2$, where v_1 , v_2 are two input analog inputs.   (4,3,3)

VI. a) Explain the working of a differentiation operation using an operational amplifier.

b) Discuss how a differentiation amplifier is different to an integration amplifier?

c) Design a circuit which can evaluate the expression $\int(v1-v2)$, where v_1 , v_2 are two input analog inputs.   (4,3,3)

VII. Write notes on:-

a) Clippers and their two applications

b) Hartley oscillator   (5,5)

x-x-x