Exam. Code: 0927
Sub. Code: 6949

1129

B.E. (Electronics and Communication Engineering)
Third Semester
EC-304: Analog Electronic Circuits – II

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) Calculate the current gain of Darlington Connection.

b) In what way is the voltage follower a special case of the Non-inverting amplifier?

c) Give any limitation of using Op-amp as a Comparator.

d) List at least three applications of Instrumentation amplifier.

e) While defining the cutoff frequencies of an amplifier, why do we take 70.7% of the mid-band gain? (5x2)

UNIT – I

II. a) What is a differential amplifier? Derive the expression of gain and input resistance of dual input balanced output differential amplifier.

b) Discuss the general characteristics of negative feedback amplifier. Derive an expression for voltage gain, input and output resistance of voltage shunt feedback amplifier. (2x5)

III. a) Draw the pi- equivalent model for a common emitter and derive for voltage gain, current gain, input resistance and output resistance.

b) What are three differential amplifier configurations? Briefly compare and contrast them?

IV. a) Draw the frequency response of a typical RC-coupled amplifier. While defining the cutoff frequencies of an amplifier, why do we take 70.7% of the mid-band gain? Why does the gain of an RC-coupled amplifier fall in (i) low frequency range (ii) high frequency range?

b) Explain the differences between constant current bias and current mirror. Why level translator is used with cascaded differential amplifier? (2x5)

P.T.O.

Time

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UNIT – II

V. a) Derive the expression for frequency of oscillation for phase shift oscillator. Design RC oscillator circuit using an op-amp.

b) Analyze the operation of a true integrator circuit and discuss the limitations of t integrator. Draw the Frequency response of basic and practical integrator circuit. (2

VI. a) Design a first order high pass filter at a cut-off frequency of 400Hz and a pass b gain of 1.

b) Explain the difference between (i) inverting and differential summing amplifiers a (ii) inverting and Non-inverting averaging amplifiers. (2x5

VII. a) How does the high frequency model of an op-amp differ from the equivalent circuit an op-amp? Explain.

b) Define input bias current and explain why it exists in all op amps. Why is it necessa to use offset minimizing resistor with practical op-amp circuits? Why is the resis *ROM* not needed in differential op-amp circuits? (2x5

x-x-x