1129
B.E. (Electrical and Electronics Engineering)
Third Semester
EE-307: Analog and Digital Electronics

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) Define Q-point.

b) Which feedback is preferred in oscillators and why?

c) How AND gate will function as OR gate?

d) What is race around condition? How it can be avoided?

e) Which is the fastest ADC? What are its applications?   (5x2)

UNIT – I

II. a) Explain the working of BJT emitter coupled differential amplifier.

b) Explain the working of op-amp as Integrator. Derive the expression of voltage output and give the condition for circuit to work as an integrator?   (2x5)

III. The hybrid parameters of CE amplifier are h_{ie}=1000 ohm, h_{fe}=150, h_{re}=1.2x10-4, h_{oe}=25x10^{-6} ohm. The transistor has load resistance of 10k ohm in collector and supplied from the signal source of 5k ohm. Calculate the values of input impedance, output impedance, current gain and voltage gain.   (10)

IV. a) Explain the working of RC phase shift oscillator. Derive the expression of output frequency.

b) Why biasing is done? Why voltage divider biasing is preferred over other biasing circuits?

UNIT – II

V. a) Find a minimal SOP representation for
f [A,B,C,D,E) = Σm [1,4,6,10,20,22,24,26) + d[0,11,16,27) using K-map method. Draw the circuit of the minimal expression using only NAND.

b) Reduce the given Boolean expression to three literals:
A'B[D'+C'D)+B(A+A'CD)

P.T.O.

VI. a) Explain the operation of 3bit binary UP-DOWN counter using JK flip-flop.

b) Convert S-R flip-Flop to JK flip flop. (2x5)

VII. a) Explain the working of Dual slope type ADC

b) Describe Sample and Hold Circuit. Give application where it can be used? (2x5)

x-x-x

UNIT – I

II. a) Explain the working of BJT emitter coupled differential amplifier.

b) Explain the working of op-amp as Integrator. Derive the expression of voltage output and give the condition for circuit to work as an integrator. (2x5)

III. The hybrid parameters of CE amplifier are $h_{ie}=1900$ ohm, $h_{fe}=150$, $h_{re}=1.2 \times 10^{-4}$, $h_{oe}=25 \times 10^{-6}$ ohm. The transistor has load resistance of 10K ohm in collector and supplied from the signal source of 5K ohm. Calculate the values of input impedance, output impedance, current gain and voltage gain. (10)

IV. a) Explain the working of RC phase shift oscillator. Derive the expression of output frequency.

b) Why biasing is done? Why voltage divider biasing is preferred over other biasing circuit?

UNIT – II

V. a) Find a minimal SOP representation for

f [A,B,C,D] = Σm (1,4,5,10,20,22,24,26) + d(11,10,27) using K-map method. Draw the circuit of the minimal expression using only NAND.

b) Reduce the given Boolean expression to three literals.

A B D + B(A + D) + B(A + A CD)

P.T.O