

7. Write short notes on any two :

- (a) R-2R ladder circuit.
- (b) Switched capacitor circuits.
- (c) SAR.

(15)

Roll No.

Total Pages : 4

008401

May 2023

B.Tech. (ECE) - IVth SEMESTER

Analog Circuits (EC-402)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Draw the circuit diagram for Diode Voltage multiplier which can give 4.5 V o/p for an input of 1.5 V i/p.
(b) When the gain of the CB configuration amplifier is less than 1, then how it can be used as an amplifier? Explain. (1.5)
(c) What is the significance of gain bandwidth product? (1.5)

- (d) What is the overall phase shift for a i/p signal in case of RC phase shift oscillator? Show how it is achieved in that oscillator circuit. (1.5)
- (e) Why do we require the concept of virtual ground? If it will not be there then what will happen? (1.5)
- (f) Why do we compute CMRR in an OP-Amp? What it signifies? (1.5)
- (g) How Active filters are different from Passive filters? (1.5)
- (h) Which one ADC is faster Dual slope or SAR and why? (1.5)
- (i) What do you understand by the term Maximum usable load? How is it different from simple R_L ? (1.5)
- (j) Which feedback is used in case of Schmitt Trigger? Also suggest the justification for that. (1.5)

PART-B

2. (a) Draw and explain the H-Parameter model for CS configuration with un-bypassed R_s in case of FET and derive results for A_v and R_o . (10)
- (b) Compare and contrast Trans conductance and Trans resistance amplifiers. Also give circuitry evidences for both the amplifiers. (5)
3. (a) Explain how can we be able to reduce the distortion in case of Push-Pull configuration? Derive an expression for that. (5)

- (b) Draw and explain the block diagram of Voltage shunt feedback technology. Also draw its electronic circuit equivalent and derive results for Gain with Feedback, R_{of} , R_{if} . Explain how the gain margin and phase margin are affected after the use of feedback? (10)
4. What is Barkhausen criterion? How it is related to Oscillation generation? Draw the circuit diagram of Hartley oscillator and explain its working. Derive an expression for frequency of sustained oscillations and condition for sustained oscillations. (15)
5. (a) What are Current Mirrors? Where these are used? Derive an expression for the maximum usable load, output resistance and minimum sustainable voltage for current mirrors. (9)
- (b) Draw the basic block diagram of Op-Amp. What are the parameters like Input bias current and Output offset voltage. (6)
6. (a) Draw and explain the circuit, waveform and working of Full wave precision rectifier. (8)
- (b) Design a low pass second order active filter using various components as per requirement and derive the expression for the frequency. (7)