

Exam.Code:0928

Sub. Code: 6585

2023

B.E. (Electronics and Communication Engineering)

Fourth Semester

EC-406: Analog Electronic Circuits

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) Define Miller's Theorem.
- b) What are the effects of cascading on voltage gain and Current gain of multistage amplifiers.
- c) List the characteristics of an ideal operational amplifier.
- d) What is the use of level translator?
- e) Define Slew Rate.
- f) Which type of feedback is applied to the oscillators?
- g) What is CMRR?
- h) List the characteristics of cascade amplifier.
- i) What is Input offset and Input Bias current?
- j) What do mean by a Schmitt trigger. (10x1)

UNIT - I

- II. a) Design the dual input balanced output differential amplifier using the diode constant current bias to meet the following specifications:
- i) Supply Voltage $V_{SS} = \pm 12V$
 - ii) Emitter current in each differential amplifier transistor = 1.5 mA
 - iii) Voltage gain ≤ 60
- b) Draw equivalent circuit and -voltage transfer curve of Op-amp. List three open loop op-amp configurations. Why open loop op-amp configurations are not used in linear applications? (2x5)

P.T.O.

(2)

- III. a) Derive an expression for output voltage, input resistance and output resistance of voltage-series feedback amplifier.
- b) In an inverting amplifier, the feedback resistance R_2 is $110\text{ K}\Omega$ and input side resistance R_1 is $2.2\text{ K}\Omega$. Estimate the gain for an ideal operational amplifier as well as for a practical operational amplifier with an open loop gain of 1000. (2x5)
- IV. a) Explain hybrid pi CE model of transistor at high frequency.
- b) Perform ac analysis of Dual Input Balanced Output Differential Amplifier (2x5)

UNIT - II

- V. a) What is the difference between Clippers & Clampers?
- b) What is Sample & hold Circuit? Why it is needed?
- c) Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz. If a sine wave of 1V peak at 1000 Hz is applied to this differentiator, draw its output waveform. (2,3,5)
- VI. a) What do you mean by slew rate? How does it affect the output voltage waveform?
- b) Design a high pass filter at the cut off frequency of 2 KHz and pass band gain of 2. Plot frequency response of this filter. (2x5)
- VII. Write note on following:-
- a) Instrumentation Amplifier
- b) Phase Shift Oscillator (2x5)