

Code: 19EC3403, 19EE3403

II B.Tech - II Semester – Regular Examinations – AUGUST 2021

ANALOG CIRCUITS
(Common to ECE, EEE)

Duration: 3 hours

Max. Marks: 70

-
- Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place
-

PART – A

1. a) List out advantages and disadvantages of negative feedback.
- b) What are the conditions for sustained oscillations?
- c) Define CMRR and show its ideal and practical values.
- d) Draw the pin diagram of IC 555.
- e) Define the terms settling time and conversion time of DAC.

PART – B

UNIT – I

2. a) Explain the following general characteristics of negative feedback amplifiers briefly.
 - i. Desensitivity
 - ii. Non-linear distortion

6 M

- b) An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% due to temperature, find the percentage change in gain of the amplifier with feedback. 6 M

OR

3. a) Develop the expression for output resistance in voltage series (series-shunt) feedback amplifier. 6 M
- b) Compare various negative feedback topologies. 6 M

UNIT – II

4. a) Develop the expression for the frequency of oscillation of RC phase shift oscillator. 6 M
- b) Draw the circuit of Colpitts oscillator. How are the feedback requirements met in it? Derive the expression for frequency of oscillation. 6 M

OR

5. a) Show that maximum efficiency of transformer coupled class A amplifier is 50%. 6 M
- b) Explain with neat diagram, the working of a class B amplifier. 6 M

UNIT-III

6. a) Discuss basic inverting and non-inverting amplifiers and derive the expression for gains. 6 M
- b) What is CMRR? For a given op-amp, $CMRR = 10^5$ and differential gain $A_d = 10^5$. Determine the common-mode gain A_{cm} of the op-amp. 6 M

OR

7. a) Draw the circuit diagram of integrator by using IC 741 op-amp and explain its operation. 6 M
- b) Draw the logarithmic amplifiers using op-amp and explain its operation. 6 M

UNIT – IV

8. a) Draw the internal diagram of IC 555 and explain its operation. 6 M
- b) Develop the expression for frequency of oscillation of astable multivibrator using 555 timer. 6 M

OR

9. a) Elaborate about first order high pass Butterworth filter circuit with neat sketches. 6 M
- b) Design a low pass filter with a cut-off frequency of 1.5 KHz and a pass band gain of 2. 6 M

UNIT – V

10. a) Develop the expression for output voltage of R-2R Digital-to Analog converter. 6 M
- b) Compare weighted resistor D/A converter and R-2R D/A converter. 6 M

OR

11. a) Describe the operation of successive approximation type analog to digital converter. 6 M
- b) List out different types of ADCs and compare their merits and demerits. 6 M