

Sample Question Paper-I

COURSE : ELECTRONICS GROUP
COURSE CODE : ET/EJ/EX/EN/DE/IE/IS/IC/IU/ED/EI
SEMESTER : FOURTH
SUBJECT : LINEAR INTEGRATED CIRCUITS
MAX MARKS : 80

9070

TIME: 3 HOUR

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of non-programmable calculator is permissible.

Q1 (a) Attempt any four of the following.

08 Marks

1. List four basic blocks of an op-amp.
2. State the two modes of operating OP AMP.
3. Give the advantages of active filter over passive filter.
4. State the effect of level translator on an output voltage swing.
5. State the function of the following with respect to the IC 555.
a) trigger b) discharge

Q1 (b) Attempt any two of the following.

08 Marks

- a. Draw the block diagram of PLL system and state its working principle?
- b. Draw the diagram for getting $V_o \propto V_1 V_2$ and give the expression at the output of each stage.
- c. Use window detector and explain how to determine the range of unknown signal with circuit diagram?

Q2. Attempt any three of the following.

12 Marks

- a. Draw and explain inverting zero crossing detector. Draw output waveform for sinusoidal input.
- b. Draw and explain PLL as a frequency multiplier with input and output waveform?
- c. Explain the concept of virtual grounding?
- d. Explain the concept of frequency compensation of OP AMP.

Q3. Attempt any three of the following.

12 Marks

- a. State the need of signal conditioning and signal processing.

- b. Draw the circuit of narrow band reject filter with labeled frequency response and expression of notch frequency.
- c. Draw and explain sample and hold circuit?
- d. Show in active integrator output voltage $V_o \propto \int V_i dt$ with circuit diagram.

Q4. Attempt any two of the following.

16 Marks

- a. Draw and explain the circuit of instrumentation amplifier using 3-opamp? Give the expression at output of each opamp.
- b. Design a circuit for water level indicator.
- c. Draw the circuit diagram of Schmitt trigger using opamp. Explain how false triggering can be eliminated. Draw input and output waveform and plot hysteresis voltage

Q5. Attempt any two of the following.

12 Marks

- a. Distinguish open loop and close loop configuration. (at least four points)
Draw the 8-pin configuration of op-amp IC 741.
- b. Draw the designed circuit for getting output voltage $V_o = -(V_a + V_b + V_c)/3$ and suggest modification for converting into scaling amplifier.
- c. Design a second order high pass butterworth filter with a cut off frequency 1.5KHz.
Draw the designed circuit.

Q6. Attempt any two of the following.

12 Marks

- a. Draw the circuit of voltage to current converter and show how output current depends on the input voltage. Give any two application of it.
- b. Design a wide band pass filter with lower cut off frequency 200Hz and higher cut off frequency 1KHz and pass band gain = 4. Calculate the value of Q for the filter?
- c. Draw and explain astable multivibrator using IC 555.
Calculate the duty cycle of it with $R_a = 3.3K\Omega$, $R_b = 10K\Omega$ and $C = 0.047\mu F$.