18EE46

Fourth Semester B.E. Degree Examination, June/July 2025
Operational Amplifiers and Linear IC's

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With a neat block diagram, explain the internal structure and characteristics of a typical operational amplifiers. (10 Marks)
   b. Explain the working of inverting and non-inverting amplifiers using ideal Op-Amp. (10 Marks)

OR

2 a. Describe the open loop configuration of an Op-Amp with relevant examples. (10 Marks)
   b. Explain the working of an instrumentation amplifier and its advantages. (10 Marks)

Module-2

3 a. Explain and design the frequency response of a second order Butterworth low pass filter. (10 Marks)
   b. Explain the working of an all pass filter and mention its applications. (10 Marks)

OR

4 a. With a neat diagram, explain the working of LM317 adjustable voltage regulator. (10 Marks)
   b. Compare LM317 and LM337 regulators and describe voltage follower regulator. (10 Marks)

Module-3

5 a. Draw the circuit of a triangular wave generator and explain its operation. (10 Marks)
   b. Explain the working of a phase shift oscillator using Op-Amp. (10 Marks)

OR

6 a. Describe the working of an inverting and non-inverting Schmitt trigger using Op-Amp. (10 Marks)
   b. With a circuit diagram, explain the operation of voltage to frequency converter. (10 Marks)

Module-4

7 a. Draw and explain the working of a precision full wave rectifier. (10 Marks)
   b. Explain the working of a voltage–current converter with a grounded load. (10 Marks)

OR

8 a. Explain the operation of an R – 2R ladder D/A converter with a neat diagram. (10 Marks)
   b. Discuss the principle and working of a successive approximation ADC. (10 Marks)

Module-5

9 a. Explain the basic building blocks and working principle of phase locked loop. (10 Marks)
   b. Define and explain capture range, lock range, and loop gain in PLL systems. (10 Marks)

OR

10 a. Draw and explain the internal architecture of 555 timer IC. (10 Marks)
   b. Describe the working of a Monostable Multivibrator using a 555 timer and mention two applications. (10 Marks)

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