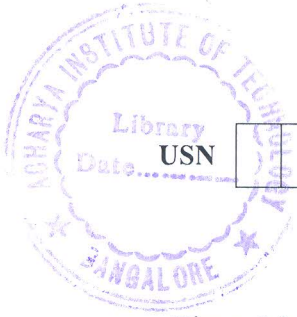


CBCS SCHEME



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17EE46

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021

Operational Amplifier and Linear ICs

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Draw the block diagram of op-amp and explain. (08 Marks)
- b. Explain instrumentation amplifier using transducer bridge. (08 Marks)
- c. Mention important characteristics of an ideal op-amp. (04 Marks)

OR

- 2 a. Explain with neat circuit diagram peaking amplifier. (08 Marks)
- b. Define (i) Input bias current (ii) CMRR (iii) Input offset current. (06 Marks)
- c. A capacitor coupled non-inverting amplifier is to have a +24V supply. A voltage gain of 100, an output amplitude of 5V, a lower cutoff frequency of 75 Hz and a minimum load resistance of 5.6 k Ω . Design suitable circuit using 741 op-amp. (06 Marks)

Module-2

- 3 a. With a neat circuit diagram explain working of 2nd order high pass filter and draw its typical frequency response curve. (08 Marks)
- b. Design first order low pass Butterworth filter at a cut off frequency of 1 kHz with passband gain of 2 and draw the circuit diagram. (08 Marks)
- c. Define the terms with respect to voltage regulator:
(i) Line regulation (ii) Load regulation. (04 Marks)

OR

- 4 a. Explain with neat circuit diagram op-amp series voltage regulator. (06 Marks)
- b. Write note on allpass filter. (06 Marks)
- c. An unregulated d.c. power supply output changes from 20V to 19.7V, when the load is increased from zero to maximum, the voltage also increases to 20.2 V when the a.c supply increases by 10%. Calculate load and source effects and load and line regulation. (08 Marks)

Module-3

- 5 a. Explain with neat circuit diagram Triangular/Rectangular wave generator. (08 Marks)
- b. Explain with neat circuit diagram R.C. phase shift oscillator using op-amp. (06 Marks)
- c. Explain voltage to current converter with grounded load. (06 Marks)

OR

- 6 a. Explain with neat circuit diagram Weinbridge oscillator. (08 Marks)
- b. Design non-inverting Schmitt trigger circuit to have UTP = +3V, LTP = -5V, use 741 op-amp, $V_{CC} = \pm 15V$. (08 Marks)
- c. What is ZCD? Explain non-inverting ZCD using op-amp. (04 Marks)

Module-4

- 7 a. Explain with neat circuit precision Half Wave rectifier. (06 Marks)
- b. What is precision rectifier? Mention its advantages. (04 Marks)
- c. Explain R-2R ladder digital to analog converter circuit. (10 Marks)

17EE46

OR

- 8 a. Explain working of ADC using successive approximation method. (10 Marks)
b. Explain with neat circuit diagram precision full wave rectifier. (10 Marks)

Module-5

- 9 a. With a neat block diagram explain basics of Phase Locked Loop. (08 Marks)
b. Define (i) Capture range (ii) Lock range (04 Marks)
c. Explain monostable multivibrator realized using 555 timer. (08 Marks)

OR

- 10 a. Explain internal architecture of IC555 timer. (10 Marks)
b. Explain Astable multivibrator using IC555 timer. (10 Marks)

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