Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70433

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fourth Semester

Electronics and Communication Engineering

EC 6404 – LINEAR INTEGRATED CIRCUITS

(Common to Medical Electronics Engineering, Robotics and Automation Engineering)

(Regulations 2013)

(Common to : PTCE 6404 – Linear Integrated Circuits for B.E. (Part–Time) – Electronics and Communication Engineering Third Semester (Regulations – 2014))

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. List the ideal characteristics of OpAmp.
2. Why is the current mirror circuit used in differential amplifier stages?
3. What is the function of a sign changer?
4. List some important applications of a Comparator circuit.
5. Mention the significances of Gilbert Multiplier cell.
6. State the various applications of phase locked loop.
7. Determine the number of comparators and resistors required for 8 bit flash type ADC.
8. Mention two advantages of R-2R ladder type Digital to Analog Converter when compared to weighted resistor type Digital to Analog Converter.
9. Draw the block schematic of IC 555 timer.
10. What is the function of a voltage regulator? Name few IC voltage regulators.

PART B — ($5 \times 13 = 65$ marks)

11. (a) (i) Draw the transfer characteristics of an operational amplifier and explain its linear and non-linear operation. (8)

(ii) Discuss the operation of BJT differential amplifier with active loads. (5)

Or

(b) (i) Present the inverting and non-inverting amplifier circuits of an op-amp in closed-loop configuration. Derive the expressions for the closed-loop gain in these circuits. (9)

(ii) Define slew rate. In what way does it possess impact on the performance of an op-amp circuit? (4)

12. (a) With neat figures describe the circuit using OpAmps on the functioning of

(i) Integrator and double integrator circuit

(ii) First order High pass filter (7+6)

Or

(b) With neat figures describe the circuit using OpAmps on the operation of

(i) Zerocross Detecter, Clipper and clamper circuits

(ii) Scmitt Trigger. (7+6)

13. (a) Derive the expression for the capture range and lock range of Phase Locked Loop.

Or

(b) Explain the application of Phase Locked Loop as

(i) Frequency synthesizer

(ii) AIVI demodulator and

(iii) FM demodulator.

14. (a) Draw the current mode R-2R Ladder DAC and explain in detail.

Or

(b) Draw the block schematic of a Single Slope type ADC and explain the same in detail.

15. (a) Write a technical note on: (7 + 6)

(i) isolation amplifier

(ii) opto coupler

Or

(b) (i) Discuss the functionalities and working of switched mode power supply. (10)

(ii) Design a monostable multivibrator using 555 timer for a pulse period of 2ms. (3)

PART C — (1 × 15 = 15 marks)

16. (a) Summarize the open-loop Op-Amp configurations in detail.

Or

(b) Explain the operation of a video amplifier IC with neat sketch.

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