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

Question Paper Code : 20929

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fourth Semester

Electronics and Communication Engineering

EC 3451 – LINEAR INTEGRATED CIRCUITS

(Common to : Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why IC 741 is not used for high frequency applications?
2. What is the advantage of Widlar current source over constant current source?
3. Write down the applications of precision diode.
4. Mention the limitations of the basic differentiator circuit.
5. Define capture range of PLL.
6. What is a compander IC? Give some examples.
7. What are the specifications of digital to analog converter?
8. Define resolution of a data converter.
9. List the merits of IC voltage regulators.
10. Define slope overload noise and granular noise.

PART B — (5 × 13 = 65 marks)

11. (a) List and explain the DC and DC characteristics of an operational amplifier.

Or

(b) Construct the BJT differential amplifier with active load and explain its operating principle.

12. (a) With a suitable circuit diagram, explain the operating principle of an instrumentation amplifier and derive its gain.

Or

(b) Analyze the first order Low pass and High pass Butterworth filter and derive its voltage gain.

13. (a) Illustrate the operation of VCO with neat block diagram. Also derive an expression for f_o. Also give the pin details of IC565.

Or

(b) Explain in detail about the various ways in which frequency synthesizers can be made from phase locked loops. Also discuss their applications.

14. (a) Draw the circuit of 4-bit binary weighted resistor DAC and explain with its input output timing diagram.

Or

(b) With block diagram, explain the working of Dual Slope ADC and Successive Approximation ADC.

15. (a) Sketch the circuit of monostable multivibrator and explain. Also derive the expression for time period.

Or

(b) Describe the internal functional block diagram of IC 723 Voltage Regulator. Also explain how positive voltage is provided by IC 723 with appropriate circuit

PART C — ($1 \times 15 = 15$ marks)

16. (a) (i) Define Slew Rate. Explain the cause of slew rate and derive an expression for Slew rate for an op-amp voltage follower. (8)

(ii) Explain Gilbert multiplier cell for four quadrant multiplication. (7)

Or

(b) Design an IC 555 astable multivibrator for an output frequency 1 kHz and a duty cycle of 60%.

———————