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Question Paper Code : 11241

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Fourth Semester

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Electronics and Communication Engineering

EC3451 — LINEAR INTEGRATED CIRCUITS

(Common to : Electronics Engineering (VLSI Design and Technology)/Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is slew rate in an operational amplifier?
2. State the need for current mirrors in op-amp circuits.
3. Define instrumentation amplifier.
4. List the applications of comparators.
5. What is the function of a voltage controlled oscillator?
6. State the purpose of a phase locked loop.
7. Define resolution of a D/A converter.
8. List the types of data converters.
9. List the merits of IC555.
10. List the features of low drop-out regulators.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the internal architecture of IC 741 with a neat diagram and discuss its stages.

Or

(b) Discuss the DC and AC characteristics of an operational amplifier.

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12. (a) Describe the working of integrator and differentiator circuits using op-amps with neat diagrams.

Or

(b) Compare logarithmic and antilogarithmic amplifier with suitable expressions.

13. (a) With a neat block diagram, explain the operation of PLL and discuss its characteristics.

Or

(b) Illustrate the working of analog multiplier using Gilbert cell.

14. (a) Explain the operation of R-2R ladder DAC with a neat diagram.

Or

(b) Distinguish between flash ADC and successive approximation ADC with suitable diagrams.

15. (a) Explain the working of 555 timer in astable mode with a neat diagram.

Or

(b) Describe the operation of IC voltage regulators and discuss their types.

PART C — (1 × 15 = 15 marks)

16. (a) Design a second-order Butterworth low-pass filter using operational amplifier and evaluate its frequency response.

Or

(b) Develop a sigma-delta analog-to-digital converter model and analyze its performance in high-resolution applications.

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