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Reg. No. :

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Question Paper Code : 50536

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth Semester

Electrical and Electronics Engineering

EE 8451 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to : Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulations – 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Is it true that NPN Transistors are preferred over PNP for IC Technology? Justify your answer.

2.   Mention the advantages of Thin Film Resistors.

3.   Compute the slew rate if a 100 pF capacitor has a maximum charging current of 150 μA.

4.   List the ideal characteristics of an Operational Amplifier.

5.   Give any four applications of comparators.

6.   Draw the circuit diagram of an Integrator using OP-AMP and give its output equation.

7.   In a Monostable Multivibrator using IC 555 Timer, the value of $R_A = 5.6\ \Omega\ and\ C = 0.068\ \mu F$. Calculate the Pulse width period (T).

8.   Define the term "Capture Range" in PLL.

9.   Differentiate Load Regulation and Line Regulation.

10. Switching Regulators are better than Series Regulators in terms of efficiency. Is this true? Justify your answer.

11. (a) With neat diagrams, explain the various steps involved in the process of IC Fabrication.

Or

(b) Explain in detail about photolithography process with neat diagram.

12. (a) Draw the circuits for Inverting and Non-inverting amplifiers using OP-AMP and derive the equation for the gain.

Or

(b) Discuss in detail about the DC and AC characteristics of OP-AMP.

13. (a) Design a RC Phase Shift Oscillator to generate a waveform of 1 kHz.

Or

(b) Illustrate the design of the second order high pass filter with its frequency response.

14. (a) Explain the working of Voltage Controlled Oscillator (VCO) and derive its output frequency.

Or

(b) Discuss the various applications of Phase Locked Loop.

15. (a) Explain in detail the working principle of switched mode power supply with necessary diagrams and waveforms.

Or

(b) Explain as to how AD623 Instrumentation Amplifier is used for Load Cell Weight measurement.

PART C — (1 × 15 = 15 marks)

16. (a) Design a monostable multivibrator using op-amp and obtain expression for pulse width T.

Or

(b) With a necessary circuit diagrams and waveforms, explain as to how a IC 555 Timer is used to design a Free Running Oscillator.