Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 73448

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Fourth Semester

Electronics and Communication Engineering

EC 2254/EC 44/10144 EC 405/EC 1254/080290022 — LINEAR INTEGRATED CIRCUITS

(Regulations 2008/2010).

(Common to PTEC 2254 Linear Integrated Circuits for B.E. (Part – Time) Third Semester – ECE – Regulations 2009)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the advantages of integrated circuits over discrete components.

2. Define offset voltage of an operational amplifier.

3. Design and sketch an operational amplifier subtractor circuit.

4. What is the difference between basic comparator and Schmitt trigger?

5. What is a two Quadrant multiplier?

6. Define frequency synthesizing.

7. Mention any two specifications of a D/A converter.

8. For an n-bit flash type A/D converter, how many comparators are required? State the disadvantage of that type of converter.

9. State the need for current limiting in voltage regulators.

10. How does switched capacitor emulate resistor?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare different configurations of Differential Amplifier. (8)

    (ii) For a dual input, balanced output differential amplifier, Rc = 2.2 kΩ, R_E= 4.7 kΩ, R_{S1} = R_{S2} = 50Ω. The supply voltages are ± 10V. The hfe for the transistor is 50. Assume silicon transistors and hie = 1.4 kΩ. Determine the operating point values, differential gain, common mode gain and CMRR. (8)

Or

   (b) (i) State the advantages of Integrated circuits over discrete components. (4)

    (ii) Explain the fabrication process of Monolithic Integrated circuits with necessary diagrams. (12)

12. (a) Explain the working principle of

    (i) Instrumentation amplifier (8)

    (ii) Schmitt trigger. (8)

Or

   (b) Explain the working principle of

    (i) Precision Full wave rectifier (8)

    (ii) Integrator. (8)

13. (a) Draw the analog multiplier IC and explain its features. (16)

Or

   (b) Explain the basic blocks of PLL and determine expressions for lock-in range and capture range. (16)

14. (a) (i) Design a suitable D/A converter to convert 8-bit binary input in parallel form. Binary '0' corresponds to 0V and binary '1' to 5V. Maximum output is +5V. Assume any other data that may be required. Explain its operation. (10)

    (ii) Write a note on high speed sample and hold circuits. (6)

Or

   (b) (i) With circuit diagram explain the operation of a flash type A/D converter. (8)

    (ii) Compare the properties of successive approximation type and dual slope type converters. (8)

2   73448

15. (a) (i) Draw the circuit using op-amp to generate triangular wave- Explain its operation. (8)

    (ii) With a neat diagram, explain the working principle of step down switching regulator. (8)

Or

(b) With a suitable circuit diagrams, explain the working of the following (8)

    (i) video amplifier.

    (ii) Voltage to frequency converter. (8)

———————

73448