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Question Paper Code: 31434

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

Fourth Semester

Electrical and Electronics Engineering

01UEE404 – ANALOG INTEGRATED CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Name the different methods used in fabrication of integrated resistors.

2. Why do we use aluminium for metallization?

3. Define the following terms: a) CMRR b) Slew rate.

4. Draw a non inverting amplifier with a voltage gain of 3.

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

6. What is meant by sample and hold circuit?

7. A PLL frequency multiplier has an input frequency of 'f' and a decade counter is included in the loop. What will be the frequency of the PLL output?

8. Under what conditions will the Gilbert cell function as a multiplier?

9. What is an Opto-coupler?

10. Mention the limitations of IC 723 general purpose regulator.

PART - B (5 x 16 = 80 Marks)

11. (a) List the levels of integration in ICs. Explain with neat diagrams the various steps involved in the fabrication of monolithic BJT, resistor and capacitor. (16)

Or

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

(ii) With neat sketch, explain the process of epitaxial growth in IC fabrication process. (12)

12. (a) Define the following DC characteristics of operational amplifier:
   (i) Input bias current
   (ii) Input offset current
   (iii) Input offset voltage
   Suggest a suitable compensation technique for each of the above. (16)

Or

(b) With neat circuit diagrams and mathematical expressions, explain the operation of the following Op-amp applications:
   (i) Scale changer
   (ii) Voltage follower
   (iii) Non inverting adder
   (iv) Integrator (16)

13. (a) Explain the following:

(i) Instrumentation amplifier (8)

(ii) Multivibrators (8)

Or

(b) Explain weighted resistor type and R-2R ladder type DAC. (16)

14. (a) Explain briefly the following applications

(i) Voltage to Frequency conversion (10)

(ii) Frequency to Voltage conversion (6)

Or

(b) Draw the block diagram of VCO and explain its operation. Also derive the frequency of oscillator. (16)

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15. (a) (i) How is IC 723 configured as high voltage regulator circuit? Draw the schematic and explain. (8)

(ii) Explain the monostable mode operation of IC 555 timer. (8)

Or

(b) (i) Draw the schematic of ICL 8038 function generator and discuss its features. (10)

(ii) With a neat diagram, explain the working of step down switching regulator. (6)

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