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Question Paper Code: 43502

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Electronics and Instrumentation Engineering

14UEI302 - LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Regulation 2014)

Duration: Threehours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

1. Aluminium is generally used of metallization because it has

   (a) Good mechanical bonds with silicon
   (b) Relatively good conductor
   (c) Deposit aluminium films on the surface
   (d) All of the above

2. What happens when the common terminal of V^+ and V^- sources is not grounded?

   (a) Twice the Voltage is applied (b) Op-amp get damaged

   (c)) a & b (d) none of the above

3. All of the following are basic op-amp input modes of operation except

   (a) inverting mode (b) common-mode (c) double-ended (d) single-ended

4. The input offset current equals the

   (a) average of two base currents
   (b) collector current divided by the current gain
   (c) difference between two base-emitter voltages
   (d) difference between two base currents

5. What is the function of a ladder network?

(a) Changing an analog signal to a digital (b) Changing a linear signal to a digital
(c) Changing a digital signal to an analog (d) None of the above

6. The main drawback of dual slope ADC converters are

(a) Long conversion (b) High cost
(c) Comparator and DAC are needed (d)none of the above

7. In a PLL, to obtain lock, the signal frequency must

(a) come within the lock range (b) be less than the capture frequency
(c) come within the capture range (d) be greater than the capture frequency

8. Following one is not the application of PLL.

(a)Frequency Multiplication (b) FSK Demodulator
(c) a & b (d) FSK Generator

9. What is (are) the principal area(s) of application for isolation amplifiers?

(a) medical (b) power plant (c) automation (d) all of the above

10. Which of the following circuits is (are) linear/digital ICs?

(a) Comparators (b) Timers
(c) Voltage-controlled oscillators (d) All of the above

PART - B (5 x 2 = 10 Marks)

11. Why aluminum is preferred for metallization?

12. Mention the characteristics of an ideal op-amp.

13. What is comparator?

14. What do you mean by monostable multivibrator?

15. List the advantages of IC voltage regulators.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain briefly about fabrication process of monolithic ICs. (16)

Or

(b) Explain in detail about Silicon wafer preparation and Photolithography. (16)

17. (a) List and explain the AC characteristics of operational amplifier with neat circuit diagram. Also mention the compensation method. (16)

Or

(b) Explain the frequency compensation techniques of OP-AMP. (16)

18. (a) (i) Explain the operation of Schmitt trigger. (8)

(ii) Write a note on V/I and I/V converter. (8)

Or

(b) (i) With neat circuit diagram explain about instrumentation amplifier. (8)

(ii) Discuss about R-2R ladder network for D/A converters briefly. (8)

19. (a) With the help of neat functional block diagram, illustrate the Astable mode operation of IC 555 timer and acquire the expression for frequency. (16)

Or

(b) (i) With the help of block diagram, describe the operation of voltage controlled oscillator and show how the output frequency of the free running multi vibrator depends on external components. (10)

(ii) Give the detailed description of the following applications of PLL with neat block diagram.

(1) Frequency multiplication / Division

(2) Frequency translation. (6)

20. (a) Draw and explain the functional block diagram of a 723 voltage regulator and how this IC can be used as High voltage regulator. (16)

Or

(b) Write an explanatory note an:

(i) Power amplifier (8)

(ii) Isolation amplifiers. (8)