Reg. No. : | | | | | | | | | | |

Question Paper Code: 43502

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

Third Semester

Electronics and Instrumentation Engineering

14UEI302 - LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. An ideal operational amplifier has

   (a) infinite output impedance (b) zero input impedance
   (c) infinite bandwidth (d) All of the above

2. Op-amps used as high- and low-pass filter circuits employ which configuration?

   (a) non- inverting (b) comparator (c) open-loop (d) inverting

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. If the gain of a closed-loop inverting amplifier is 3.9, with an input resistor value of 1.6 *kilo ohms*, discriminate the value of feedback resistor?

   (a) 6240 *ohm*s (b) 2.4 *kilo ohms* (c) 410 *ohms* (d) 0.62 *kilo ohms*

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. Evaluate the maximum conversion time of a clock rate of 1 *MHz* operating a 10-stage counter in an ADC.

(a) 1.024 *s* (b) 102.3 *ms* (c) 1.024 *ms* (d) 10.24 *ms*

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

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

8. An astable multivibrator is also known as a

(a) one-shot multivibrator (b) free-running multivibrator
(c) bistable multivibrator (d) monostable multivibrator

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. Point out the reason why IC 741 is not used for high frequency applications?

12. Summarize the need for frequency compensation in practical op-amps.

13. What are the applications of V-I converter?

14. For perfect lock, illustrate the phase relation between the incoming signal and VCO output signal?

15. What is an opto-coupler IC? Give examples?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about monolithic IC technology. (16)

Or

(b) (i) Sketch the internal circuit of an IC 741. (6)

(ii) Discuss in detail about ideal op-amp characteristics. (10)

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

Or

(b) Prove that op-amp acts as a Differentiater. (16)

18. (a) Explain the operation of Schmitt trigger. (16)

Or

(b) Draw the circuit of a second order Butterworth low pass filter and derive its transfer function. (16)

19. (a) What is 555 timer? What are the features of 555 timer? Explain the Astable mode in detail. (16)

Or

(b) Describe the application of PLL for frequency multiplication and amplitude Modulation detector with neat diagrams. (16)

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) (i) Discuss in detail about isolation amplifier. (8)

(ii) Explain the functional diagram of LM 380 power amplifier. (8)