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**Question Paper Code: 43502**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Electronics and Instrumentation Engineering

14UEI302 - LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Regulation 2014)

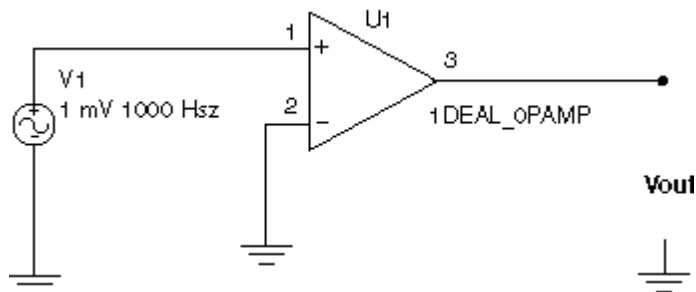
Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- An ideal operational amplifier has
  - infinite output impedance
  - zero input impedance
  - infinite bandwidth
  - all of the above
- Input impedance of an inverting amplifier is approximately equal to
  - $R_i$
  - $R_f + R_i$
  - $\infty$
  - $R_f - R_i$
- Evaluate the output waveform of the circuit?



- sine wave
- square wave
- sawtooth wave
- triangle wave

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 *ohms*                      (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. Why aluminum is preferred for metallization?
12. Mention the characteristics of an ideal op-amp.
13. What are the applications of V-I converter?
14. What do you mean by monostable multivibrator?
15. Give the classification of voltage regulators.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about Silicon wafer preparation and Photolithography. (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) Explain the following terms in an OP-AMP.
- (i) Bias current (4)
  - (ii) Thermal drift (4)
  - (iii) Input offset voltage and current (4)
  - (iv) Thermal drift. (4)
18. (a) Explain the operation of Schmitt trigger. (16)
- 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) What is 555 timer? What are the features of 555 timer? Explain the Monostable 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) Write an explanatory note on:
- (i) Power amplifier (8)
  - (ii) Isolation amplifiers. (8)

