Reg. No. :

Question Paper Code: 54501

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

Fourth Semester

Electronics and Instrumentation Engineering

15UEI401 - LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Why an op-amp without feedback does is not used in linear circuit application?

   (a) Due to high current gain   (b) Due to low voltage gain

   (c) Due to high output signal   (d) Due to high voltage gain

2. How does the open loop op-amp configuration classified?

   (a) Based on the output obtained   (b) Based on the input applied

   (c) Based on the amplification   (d) Based on the feedback network

3. Which factor makes the differentiator circuit unstable

   (a) Output impedance   (b) Input voltage
   (c) Noise   (d) Gain

4. The purpose of level shifter in Op-amp internal circuit is to

   (a) Adjust DC Voltage   (b) Increase Impedance
   (c) Provide high gain   (d) Decrease input resistance

5. How the op-amp comparator should be chosen to get higher speed of operation?

   (a) Large gain   (b) High slew rate   (c) Less gain   (d) Wider bandwidth

6. A digital-to-analog converter is an application of the

    (a) Scaling adder   (b) Voltage-to-current converter
    (c) Non inverting amplifier   (d) Adjustable bandwidth circuit

7. The _____ is defined as the time the output is active divided by the total period of the output signal

    (a) On time   (b) Off time   (c) Duty Cycle   (d) Active ratio

8. At what range the PLL can maintain the lock in the circuit?

    (a) Lock in range   (b) Input range   (c) Feedback loop range   (d) output range

9. Which type of IC voltage regulator exhibits continuous variation in the impedance of transistor in order to supply the desired load current?

    (a) Linear regulators   (b) Switching regulators
    (c) Series regulators   (d) Shunt regulators

10. Which one can be used for the purpose of isolation?

    (a) Voltage regulator   (b) Multivibrator
    (c) Optocoupler   (d) Power amplifier

PART - B (5 x 2 = 10 Marks)

11. Define the term Bird's peak in IC fabrication.

12. Define slew rate and what is the cause for it?

13. The basic step of a 9 bit DAC is 10.3 mV. If 000000000 represents 0 Volts, what is the output for an input of 101101111?

14. State Pull-in time.

15. List the non- linear applications of op-amps.

PART - C (5 x 16 = 80 Marks)

16. (a) Summarize the steps involved in the fabrication of monolithic devices in a single substrate.   (16)

Or

(b) Apply basic fabrication steps to design monolithic transister.   (16)

54501

17. (a) (i) Brief about input bias current and input offset currents of operational amplifier. (8)

(ii) Describe about the condition for stability of an op-amp. (8)

Or

(b) Explain integrater and differentiater in detail with waveforms. (16)

18. (a) (i) Draw the circuit of a weighted resistor DAC and explain its working principle. (6)

(ii) Brief about the principle of operation of successive approximation type ADC with neat block diagram. (10)

Or

(b) (i) Draw the circuit of a weighted resistor DAC and explain its working principle. (6)

(ii) Brief about the principle of operation of successive approximation type ADC with neat block diagram. (10)

19. (a) Assess the functioning of BI-stable Multivibrator using IC555 timer and derive its expression for output frequency. (16)

Or

(b) Discuss the block diagram of PLL and summarize its region of operation. (16)

20. (a) Interpret the working of LM723 voltage regulator and modify the circuitry to function as low and high voltage regulator. (16)

Or

(b) Write an explanatory note on (i) Opto coupler (ii) Isolation amplifiers . (16)

54501