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

Question Paper Code: 54501

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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. In IC fabrication, oxidation is used for

   (a) Isolation (b) Surface passivation (c) Packaging (d) Doping

2. For an ideal op-amp, the CMRR will be

   (a) 1 (b) 0 (c) Infinity (d) Negative

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. The closed loop comparator is otherwise called as

   (a) Monostable Multivibrator (b) Astable Multivibrator
   (c) Bistable Multivibrator (d) Schmitt Trigger

6. A binary-weighted digital-to-analog converter has an input resistor of 100KΩ. If the resistor is connected to a 5 V source, the current through the resistor is: Non-monotonic error

   (a) 50 μA (b) 500 μA (c) 5 mA (d) 50 mA

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. What is the expression for time period of a mono-stable 555 multi-vibrator

(a) T= 0.33RC (b) T= 1.1RC (c) T= 3RC (d) T= RC

9. Switching voltage regulators have _____ than linear regulators?

(a Longer life (b) Simpler Circuitry
(c) Greater Efficiency (d) Lower Cost

10. 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) Both (a) and (b) (d) None of these

PART - B (5 x 2 = 10 Marks)

11. Calculate the voltage gain and output voltage of an inverting op-amp with R_1=3.3 kΩ and R_2= 33kΩ when the input voltage is 0.5V.

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. Modify the analog multiplier circuit towork as square root circuit?

15. Write the significance of isolation amplifiers.

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 resistor. (16)

17. (a) Evaluate the expression for slew rate and examine the effects and methods for improving the slew rate. (16)

Or

(b) (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)

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) Explain the working of Monostable Multivibrator using Op-Amp and derive its equation for time period. (16)

19. (a) Explain the operation of IC565 phase locked loop with neat circuit diagram and derive its necessary equations. (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) (i) Explain the functioning of LM380 power amplifier with its neat diagram. (8)

(ii) With neat diagram, describe the functioning of function generator using op-amp. (8)
