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

Question Paper Code: 44042

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electronics and Communication Engineering

14UEC402 - ANALOG CIRCUITS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Sinusoidal oscillators operate with _____ feedback

   (a) Positive (b) Negative
   (c) Both a and b (d) None of the above

2. For sustained oscillation the value of Aβ must be

   (a) = 1 (b) > 1 (c) <1 (d) ≠ 1

3. Monostable multivibrator has ___ quasi stable state.

   (a) One (b) Two (c) Three (d) None of these

4. Pulse stretching, time-delay, and pulse generation are all easily accomplished with which type of multivibrator circuit?

   (a) Astable (b) Monostable (c) Multistable (d) Bistable

5. The speed of a comparator is expressed by means of

   (a) Response time (b) Accuracy
   (c) logic threshold (d) None of these

6. Etching is the process used for

(a) Selective removal of unwanted surfaces (b) Cleaning
(c) Interconnection (d) None of the above

7. In an instrumentation amplifier, the output voltage is based on the _____ times a scale factor.

(a) Summation of the two inputs (b) Product of the two inputs
(c) Difference between the two inputs (d) None of these

8. Wide band pass filter has Q factor

(a) = 10 (b) > 10 (c) <10 (d) = 100

9. What mode of operation of the timer IC is utilized for a frequency divider?

(a) Monostable (b) Bistable (c) Astable (d) None of these

10. Which of the following devices are components of a digital-to-analog converter (DAC)?

(a) Integrator (b) Comparator
(c) Digital counter (d) All of the above

PART - B (5 x 2 = 10 Marks)

11. Mention two conditions for a circuit to generate oscillations.

12. What is a Clamper? What are its uses?

13. Define slew rate?

14. What is a Schmitt trigger?

15. Compare and contrast binary ladder and R-2R ladder DAC.

PART - C (5 x 16 = 80 Marks)

16. (a) A crystal has the following parameters L = 0.5 H, C_s = 0.006 pF, C_p = 1 pF and R = 5KΩ. Find the series and parallel resonant frequencies and Q factor of the crystal. (16)

Or

(b) Describe the working principle of Colpitt's oscillator and derive the frequency of oscillation. (16)

17. (a) (i) Explain the working principle of Bistable multivibrator with neat diagram. (8)

(ii) Illustrate the trigerring methods for bistable multivibrators. (8)

Or

(b) Explain the operation of a Schmitt trigger using two transistors for a sinusoidal input with Circuit diagram and waveforms. (16)

18. (a) (i) With neat block diagram, explain the general stages of an operational amplifier. (8)

(ii) Define slew rate. Explain the cause of slew rate and derive the expression for slew rate of an operational amplifier voltage follower. (8)

Or

(b) Illustrate the manufacturing process of monolithic IC's with neat diagram. (16)

19. (a) With a neat sketch, explain the working of (i) Schmitt trigger (ii) Precision Rectifier. (16)

Or

(b) Draw the functional block schematic of a NE565 PLL and explain the roles of the low pass filter and VCO. Derive the expression for the capture range and lock range of the PLL. (16)

20. (a) Draw and explain the functional block diagram of three terminal fixed and adjustable voltage regulator. (16)

Or

(b) Describe the operation of dual slope and successive approximation type ADC. What are the advantages of dual slope ADC? (16)