Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 44402

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

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. Which of the following is an oscillator with best frequency stability?

    (a) Crystal oscillator   (b) Clapp oscillator
    (c) Phase shift circuit   (d) Multi vibrator

2. The gain of amplifier stage of a phase-shift oscillator must be greater than

    (a) 19   (b) 29   (c) 30   (d) 1

3. Free running oscillator is also called as_____ multivibrator.

    (a) Astable   (b) Bistable   (c) monostable   (d) blocking

4. Astable multivibrator is basically a

    (a) RF amplifier with negative feedback
    (b) RF amplifier with positive feedback
    (c) Two stage double tuned amplifier
    (d) Two stage RC coupled amplifier

5. Monolithic IC consists of

    (a) Active components   (b) Passive components
    (c) Both a and b   (d) None of the above

6. _____means growing single crystal silicon structure upon a original silicon substrate.

    (a) Etching   (b) Epitaxy   (c) Ion implantation (d) Diffusion

7. The voltage follower has a

    (a) small open – loop voltage gain
    (b) large closed loop output impedance
    (c) closed loop bandwidth of zero
    (d) closed loop voltage gain of unity

8. 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

9. This circuit is an example of a
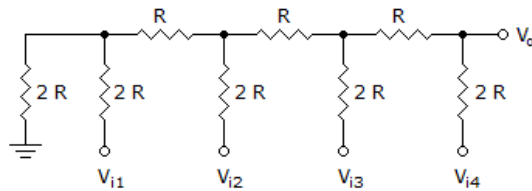
    (a) comparator   (b) 555 timer
    (c) D to A converter   (d) ladder network

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

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

PART - B (5 x 2 = 10 Marks)

11. Why LC tank circuit does not produce sustained oscillations. How can they overcome?

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

13. Why aluminum is preferred for metallization?

14. Define capture range of a PLL.

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

44402

16. (a) (i) Explain Armstrong oscillator and derive its frequency of oscillation. (8)

(ii) A Colpitts oscillator is designed with $C1 = 100pF$ and $C2 = 7500pF$. The inductance is variable. Determine the range of inductance values if the frequency of oscillation is to vary between 950 kHz and 2050 kHz. (8)

Or

(b) (i) Discuss the classification of oscillators. (4)

(ii) Explain Barkhausen criterion for sustained oscillations. (12)

17. (a) (i) Describe the response of low pass RC circuit for step and square wave input. Sketch the circuits and waveforms. (8)

(ii) Explain with suitable circuit and waveforms, the operation of negative clampers. (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) Discuss the various ways to fabricate diodes. (8)

(ii) Explain how a monolithic capacitor can be fabricated? (8)

Or

(b) What is the need for frequency compensation in practical op-amps? Explain the frequency compensation techniques in detail. (16)

19. (a) (i) For a maximum frequency of 100 Hz design a differentiator circuit and draw the frequency response for the same. (8)

(ii) Discuss the working of Scale Changer with a neat sketch. (8)

Or

(b) Draw and explain the circuit of voltage to current converter and current to voltage converter. (16)

44402

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

Or

(b) (i) Discuss the operation of sample and hold circuit with circuit diagram. (8)

(ii) With block diagram, explain the working of IC555 in Astable mode. (8)

————————————

44402