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**Question Paper Code: 41442**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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)

- The phase shift around the feedback loop of an oscillator is  
(a)  $360^\circ$                       (b)  $270^\circ$                       (c)  $90^\circ$                       (d)  $30^\circ$
- \_\_\_\_\_ is the oscillator that has highest frequency stability.  
(a) Hartley                      (b) Colpitts                      (c) Clapp                      (d) Crystal
- Free running oscillator is also called as \_\_\_\_\_ multivibrator.  
(a) Astable                      (b) Bistable                      (c) monostable                      (d) blocking
- \_\_\_\_\_ Circuit is used to restore dc value to the input signal.  
(a) clamper                      (b) clipper                      (c) recitifier                      (d) integrator
- The open loop gain of an ideal Op amp is  
(a) infinite                      (b) finite                      (c) zero                      (d) unity
- \_\_\_\_\_ means growing single crystal silicon structure upon a original silicon substrate.  
(a) Etching                      (b) Epitaxy                      (c) Ion implantation                      (d) Diffusion
- \_\_\_\_\_ is a nonlinear application of operational amplifier.  
(a) Adder                      (b) Subtractor                      (c) Differentiator                      (d) Comparator

8. Precision rectifier are used to rectify voltages in range of \_\_\_\_\_volts.  
(a) milli                      (b) kilo                      (c) mega                      (d) giga
9. \_\_\_\_\_ diode is used for liner voltage regulation.  
(a) PN junction              (b) Avalanche              (c) Zener                      (d) Schottky
10. A flash type ADC requires \_\_\_\_\_ comparators for an  $n$ -bit conversion.  
(a)  $1-2^n$                       (b)  $2^n+1$                       (c)  $2^n -1$                       (d)  $2^n$

PART - B (5 x 2 = 10 Marks)

11. Sate Barkhausen criterion for sustained oscillation.
12. Draw a clipper circuit which clips all voltages above +2V.
13. List out the steps used in the preparation of Si – wafers.
14. What is a Schmitt trigger?
15. Draw the block diagram of Successive Approximation type ADC.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the operation of RC phase shift oscillator with a neat circuit diagram and derive the expression of frequency of oscillation and the condition for sustained oscillation. (16)

Or

- (b) Derive the condition for oscillation for a LC oscillator. (16)
17. (a) Describe the response of low pass RC circuit for step and square wave input. Sketch the circuits and wave forms. (16)

Or

- (b) Explain the operation of collector coupled Astable multivibrator with neat circuit diagram and waveforms. Derive the expression of the time period. (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) Explain the working of PLL with neat block diagram and derive the expression for lock in range and capture range. (16)

Or

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

20. (a) Draw and explain the functional block diagram of a 723 regulator. (16)

Or

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

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