KUMARAGURU
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2013

(Regulation 2009)

Fourth Semester

EEE106: LINEAR INTEGRATED CIRCUITS

(Common to ECE/EEE/EIE)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. What is the melting temperature of Si?
   a) 1420^{o} C b) 1520^{o} C
   c) 1400^{o} C d) 1200^{o} C
2. The process used for the removal of SiO_2 layer is called
   a) Masking b) Etching
   c) Diffusion d) Ion implantation
3. The open loop voltage gain of the ideal op-amp should be
   a) 0 b) 1
   c) Infinite d) Low
4. Offset adjustment in an op amp is done with pin numbers
   a) 4&7 b) 2&3
   c) 1&5 d) 6&8
5. What type of ADC is particularly suitable for accurate measurement of slow varying signals?
   a) Successive approximation b) Dual slope
   c) Flash type d) All of the above
6. Wide band pass filter has
   a) Q < 10 b) Q > 10
   c) Q = 10 d) Q = 1
7. The output of VCO will always be _____ phase shift with that of the incoming signal in PLL.
   a) 90deg b) 180 deg
   c) 270deg d) 360 deg

8. Choose the component used in feedback path of PLL.

a) Low pass filter b) Phase detector

c) VCO d) amplifier

9. Switching regulators are used as replacements for linear regulators when

a) Higher efficiency b) Smaller size

c) Lighter weight d) All of the above

10. In voltage regulator, OP-AMP is used as

a) Voltage follower b) Error amplifier

c) Inverting amplifier d) Non inverting amplifier

PART B (10 x 2 = 20 Marks)

11. List out the steps involved in the preparation of Si – wafer.
12. Mention the importance of SiO_2?
13. With reference to an OP AMP, define supply voltage rejection ratio.
14. In response to a square wave input, the output of an OP AMP changed from–3V to +3V over a time interval of 0.25s. Determine the slew rate of the OP AMP.
15. State the important features of an instrumentation amplifier.
16. Using an OP AMP, draw the circuit diagram of a phase shift oscillator.
17. What is a two quadrant multiplier?
18. With reference to a PLL, define 'Pull in Time'
19. What is an opto coupler IC? Give examples.
20. State the limitations of linear voltage regulators.

PART C (5 x 14 = 70 Marks)

21. a) Discuss the various steps involved in the monolithic IC fabrication.

(OR)

b) (i) Explain the process of fabricating BJT with neat diagram. (10)

(ii) Draw the final structure of CMOS fabricated using Twin well process. (4)

22. a) (i) List and explain the non-ideal DC characteristics of an operational amplifier. (10)

(ii) Explain the AC characteristics of an operational amplifier. (4)

(OR)

b) (i) Sketch the basic circuit using op-amp to perform the mathematical operation of differentiation and explain its frequency response. What are the limitations of an ordinary OP-AMP differentiator? (10)

(ii) Draw and explain the circuit of a practical differentiators that will eliminate these limitations. (4)

23. a) (i) Explain the working of OP-AMP based Schmitt trigger circuit. (7)

(ii) Design an OP-AMP based second order active low pass filter with cut off frequency 2 kHz. (7)

(OR)

b) Draw and explain the circuit of a voltage to current converter if the load is (i) Floating (ii) Grounded.

24. a) Explain the operation of Gilberts multiplier with neat sketches.

(OR)

b) What is Phase locked loop? Explain its operation with diagrams.

25. a) Sketch the functional block diagram and explain their working principle of General purpose voltage regulator IC 723.

(OR)

b) (i) With neat diagram, explain the working principle of isolation amplifier. (7)

(ii) With neat diagram, explain the principle of operation of optocouplers. (7)

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