KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY 2015

(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. Silicon dioxide is used as a
   a) Diffusion element b) Mask against diffusion
   c) Contact element d) Active element
2. Which of the following is not linear/digital IC?
   a) Phase locked loop b) Voltage-controlled oscillator
   c) Passive filter d) Comparator
3. The 741 IC has a unity gain frequency of
   a) 10Hz b) 20kHz
   c) 1MHz d) 15MHz
4. For step- input, the output of an integrator is a
   a) pulse b) Triangular waveform
   c) spike d) ramp
5. In a zero-level detector , the output changes state when the input
   a) Is positive b) Is negative
   c) Crosses zero d) Has a zero rate of change
6. In a binary R/2R ladder D/A converter, the input resistance for each input is
   a) R b) 2R
   c) 3R d) 4R
7. When the two inputs of a multiplier are connected together, the device operates as a
   a) Voltage doubler b) Square root circuit
   c) Squaring circuit d) Averaging circuit
8. The timing components for a PLL are 15 kΩ and 220 pF. The free-running frequency is

a) 90.91 kHz
b) 136.36 kHz
c) 156.1 kHz
d) 181.8 kHz

9. The primary function of the oscillator in an isolation amplifier is to
a) convert dc to high-frequency ac
b) convert dc to low-frequency ac
c) rectify high-frequency ac to dc
d) produce dual-polarity dc voltages for the input to the demodulator

10. The LM380 IC is a
a) Switching regulator
b) Power amplifier
c) Function generator
d) Voltage regulator

PART B (10 x 2 = 20 Marks)

11. Name different types of IC packages.
12. What is meant by parasitic capacitance in an IC?
13. What is PSRR? What should be its ideal value?
14. Draw the input and output waveforms for an integrator for step type of input.
15. Summarize the applications of voltage to current converter.
16. Infer the necessity of sample and hold circuit.
17. Define Lock range.
18. What is companding?
19. Which are the basic elements of voltage regulator circuit?
20. List the important features of IC 723.

PART C (5 x 14 = 70 Marks)

21. a) Illustrate the steps encompassed by the photolithographic process.

(OR)

b) Describe the various stages involved in the fabrication of a CMOS in a single chip.

22. a) i) Outline the DC characteristics of an op-amp (7)
ii) Draw an op-amp circuit to implement the following expression: (7)
$V_0=V_1+V_2 - [V_3+V_4+2]$

(OR)

b) i) Discuss the role of internal frequency compensation in op-amps. (7)
ii) Derive a expression for a closed loop gain of an ideal inverting amplifier. (7)

23. a) i) Explain the operation of a triple-op-amp instrumentation amplifier. (7)

ii) Design an op-amp to generate a pulse waveform of frequency 2kHz. (7)

(OR)

b) Illustrate in detail about successive approximation ADC and dual slope ADC

24. a) i) Draw the functional diagram of astable multivibrator using IC 555 timer and explain its operation. (10)

ii) A 555 timer is configured to run in astable mode with R_A= 4 Kohm, R_B= 4 Kohm and C=0.01microFarad. Determine the frequency of the output and duty cycle. (4)

(OR)

b) i) How does the voltage controlled oscillator (VCO) operate in PLL configuration? (7)

ii) Depict the block diagram of a PLL synthesizer and explain. (7)

25. a) i) Write short notes on opto coupler. (7)

ii) Design a low voltage regulator using IC 723 with 5 V output. (7)

(OR)

b) With simplified block diagram explain the basic principle of ICL 8038 function generator and depict its pin configuration.

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