KUMARAGURU
college of technology
character is life

Register Number: …….

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Fourth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U13ECT403: Linear Integrated Circuits

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In constant current source the BJT transistors are operated in _____.
   a) Saturation region b) Cut off region
   c) Active region d) Differential mode
2. The gain and CMRR of an ideal operational amplifier is _____.
3. How many op-amps are required to implement equation $V_o = V_1$?
   a) 1 b) 2
   c) 4 c) 3
4. The Voltage controlled oscillator generates ac signal proportional to _____
5. One input terminal of high gain comparator circuit is connected to ground and a sinusoidal voltage is applied to the other input. The output of comparator will be
   a) sinusoid b) a full rectified sinusoid
   c) a half rectified sinusoid d) Square wave
6. The range of frequencies over which the PLL can maintain lock with the incoming signal is called the _____
7. The fastest ADC is _____
   a) SAR ADC b) Single slope ADC
   c) Counter type ADC d) Flash ADC
8. Resolution of a 12-bit DAC is _____
9. Which one is not applicable to 555 timer
   a) Astable a) Monostable
   c) VCO c) multiplier
10. The use of isolation amplifier is _____

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. An op-amp operates as a unity gain buffer with 3Vpp square wave input. If op amp is ideal with slew rate 0.5V/µsec, find the maximum frequency of operation.
12. List the ac and dc characteristics of operational amplifier
13. What is an active filter?
14. Draw the circuit of precision diode.
15. List the various applications of PLL.
16. List the input conditions for analog multiplier to operate in different modes.
17. Which is the fastest ADC and why?
18. What is the advantage of R-2R ladder DAC?
19. Mention the different modes of operation of 555 IC timer.
20. What is the need for dc level shifter in the construction of IC741 operational amplifier?

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Sketch and explain the operation of a basic current mirror circuit.
Derive the expression for output current.

22. a) (i) Explain Instrumentation amplifier using operational amplifier. (10)

(ii) Design an inverting amplifier with a gain of 40dB and a non inverting amplifier with a gain of 80dB. (4)

(OR)

b) (i) Explain the operation of Differentiator and compare the frequency response of ideal and practical differentiator (10)

(ii) For a Schmitt trigger show in below, calculate the threshold voltage level and hysteresis. Assume $V_{sat} = 0.9V_{cc}$. (4)

23. a) Explain Gilbert multiplier cell. Under what condition Gilbert multiplier cell work as a phase detector

(OR)

b) (i) Explain the working of phase locked loop with block schematic. (10)

(ii) Explain any one application of PLL. (4)

24. a) Explain the working principle of Dual slope analog to digital converter (ADC). State its advantages and limitations

(OR)

b) Explain the working principle of R2R DAC and state its advantage and limitations.

25. a) Explain the working of a one shot multivibrator circuit using 555 timer with necessary diagram and waveforms.

(OR)

b) With a neat sketch explain the internal architecture of function generator IC8038.

****