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JAYA GROUP OF INSTITUTIONS – THIRUNINRAVUR.

4TH SEMESTER – B.E / B.Tech.

INTERNAL ASSESSMENT - III (MODEL EXAMINATION - III)

Sub.Name: LINEAR INTEGRATED CIRCUITS

Date:10/04/2015

Sub.Code: EC6404

Branch: ECE

Duration: 180 Minutes

Max.Marks:100

PART – A (10X2=20) Answer all questions

1. What is current mirror?
2. What are the advantages of integrated circuits over discrete circuits?
3. Define pass band and stop band of a filter.
4. Draw and write equation of an integrator using op-amp.
5. List the applications of analog multipliers.
6. What is phase detector? Give the classification.
7. What are the main advantages of integrated type ADC?
8. Define resolution and conversion time of DAC.
9. Sketch the monostable multivibrator circuit diagram using IC 555.
10. What are the three different wave forms generated by ICL8038?

PART – B (5X16=80) Answer the questions as per the choice

11. a) i) Explain the working of BJT emitter coupled differential amplifier with active load and draw the relevant circuit diagram. (8)
- ii) With a neat circuit diagram and explain the concept of Widler current source and Wilson current source. (8)

OR

- b). i) Discuss about input offset current and input offset voltage of op-amp. (8)
- ii) Explain the frequency response of op-amp characteristics. (8)
12. a) i) Explain how log and antilog amplifier computations are performed using IC741. (12)
- ii) Explain in Precision rectifier and application of Precision diode. (4)

OR

b) i) Draw and explain a simple op-amp differentiators. Mention its limitations. Explain with a neat diagram how it can be over in a practical differentiators. Design an Op- amp differentiators that will differentiate an input signal with maximum frequency $f_{\text{max}} = 100\text{Hz}$. (8)

ii) Explain the working of op-amp based Schmitt trigger circuit. (8)

13. a) i) Explain the variable trans conductance technique in analog multiplier and give its output equation. (8)

ii) Explain the working of Voltage controlled oscillator. (8)

OR

b) Perform the closed loop analysis of PLL and explain any two application of PLL. (16)

14. a) i) A Dual slope ADC uses a 16 bit counter and a 4 MHz rate. The maximum input voltage is +10 V. The maximum integrator output voltage should be -8V when the counter has cycled through 2^n counts. The capacitor used in the integrator is $0.1 \mu\text{F}$. Find the value of the resistor R of the integrator. (8)

ii) Explain the operation of weighted resistor type DAC converter and what are the limitations. Explain how this problem can be solved in R-2R ladder type DAC converters. (8)

OR

b) i) What is sample and hold circuit? Explain its construction and application. (8)

ii) Explain the working of successive approximation type ADC converter. (8)

15. a) Sketch the functional block diagram of the following and explain their working principle:

i) IC 555 timer. (8)

ii) General purpose voltage regulator IC723. (8)

OR

b) Sketch the functional block diagram of the following and explain their working principle:

i) Isolation amplifier. (8)

ii) Optocouplers. (8)