(36)

B.E DEGREE END SEMESTER EXAMINATIONS, APR / MAY 2013
B.E (Biomedical Engineering)
Fourth Semester
EC 9302 Linear Integrated Circuits

Time : 3 Hours Max : 100 Marks

Answer ALL Questions
PART- A (10×2=20)

1. What are the assumptions made from ideal opamp characteristics?
2. Why IC 741 is not used for high frequency applications?
3. List the features of instrumentation amplifier.
4. Design an op-amp differentiator that will differentiate an input signal with Fmax = 2 kHz.
5. Define lock range and capture range of the PLL.
6. List the features of 566 VCO.
7. What is a sample and hold circuit? Where it is used?
8. Define resolution of a data converter.
9. What is the purpose of having input and output capacitors in three terminal IC regulators?
10. List the applications of 555 timer in monostable mode of operation:

PART-B

11. Draw the functional block schematic of a NE565 PLL and explain the roles of the low pass filter and VCO. Derive the expression for the capture range and lock in range of the PLL. (16)

12. (a) i) Write operation of Differential amplifier. With its necessary equations derive CMRR. (12)
ii)How the CMRR has been improved using current mirror. (4)
(Or)
(b) i) Discuss different frequency compensation techniques in difference amplifier. (8)
ii) Define slew rate and describe a method of improving slew rate. (8)

13. (a) i) Explain the working principle of Schmitt trigger. (10)
ii) With relevant circuits, explain OPAMP Voltage to current converters (6)
(Or)
(b) i) With diagram explain the principle of operation of triangular waveform generator using opamp(10)
ii) Design an opamp circuit to give an output voltage V0 = 6V1 —5V2 + 3V3 where V1, V2 and V3 are inputs. (6)

14. (a) i) Describe the operation of dual slope ADC and What are the advantages of dual slope ADC? (10)
ii) Explain the operation of Flash type DAC with its neat diagram. (6)
(Or)
(b) i) Design a 10 bit SAR ADC for Vin =0.6V, Vfsr = 1V. (10)
ii) Discuss different types of analog switches. (6)

15. (a) i) Draw the circuit of one shot oscillator using 555 IC and explain its operation in detail. (10)
ii) give detail about the types of noises present in IC's. (6)
(Or)
(b) Briefly explain the working principle of switch mode power supply with necessary circuit diagram and waveforms. (16)