Question Paper Code : 90202

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fourth Semester

Electrical and Electronics Engineering

EE8451 – LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Classify ICs based on the Manufacturing techniques. Name any two merits.

2. List the steps used for preparation of Silicon Wafer.

3. Recall the Ideal OP-AMP characteristics.

4. Distinguish between Input Offset voltage and Input Offset current.

5. Draw the circuit of antilog OP-AMP amplifier.

6. What is Astable Multivibrator ?

7. In a Monostable multivibrator using 555 timer, the components values are

   RA = 5.6 Ω and C = 0.068 μF. Find the Pulse width period T.

8. List the applications of PLL.

9. Name the important performance parameters of 3 terminal IC regulators.

10. Draw the PIN diagram of IC 723 regulator.

PART – B (5×13=65 Marks)

11. a) Discuss with necessary diagram, the basic process for fabrication of ICs using Silicon IC Planar technology.

(OR)

b) Explain with neat diagram, the different methods of fabricating the integrated resistor.

12. a) Discuss with neat diagram, the DC characteristics of OP-AMP with necessary expressions.

(OR)

b) Illustrate with neat diagram, the working of inverting and Non-inverting amplifiers by using OP-AMPs. Develop the expressions for output voltages.

13. a) Elaborate with neat circuit diagrams and input/output waveforms, the operation of positive clipper and peak clamper.

(OR)

b) Explain with a neat sketch, the working of successive approximation type analog to digital OP-AMP converter.

14. a) Demonstrate with neat functional diagram, the working of 555 IC timer. Develop the expression for pulse width of rectangular output pulse.

(OR)

b) Explain with neat diagram, the working of a phase locked loop.

15. a) Discuss with neat diagram, the working of IC 7805 regulator as

i) Current source   (3)

ii) Boosting regulator output current   (5)

iii) IC 7805 regulator as current source   (5)

(OR)

b) Elaborate with neat diagram, the working of IC 723 as low voltage and high voltage regulators.

PART – C (1×15=15 Marks)

16. a) Design an astable multivibrator that can produce an output with $T_{on}=T_{off}=1$msec. The OP-AMP is driven with a +15 and −15V supply. Draw the waveforms across capacitors, feedback and output. The hysteresis should not exceed 0.1V.

(OR)

b) For a non-inverting amplifier shown in Figure 16. b, $R_1 = 1k\Omega$, $R_f = 10k\Omega$. Calculate i) the maximum output offset voltage due to input offset voltage ($V_{os} = 10$mV) and Bias current ($I_B = 300$nA) and offset current $I_{os} = 50$nA. ii) Calculate the value of R_{comp} need to reduce the effect of I_B. iii) Calculate the maximum output offset voltage if R_{comp} is connected in the circuit.   (5+5+5)
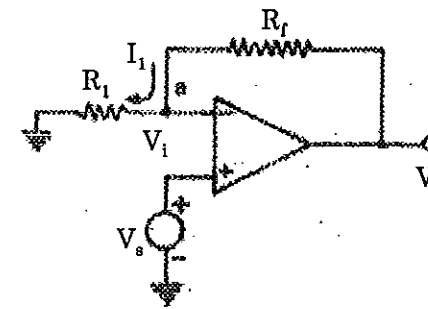

Fig. 16.b