E 1244 (Pages : 2) Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2015

Third Semester

Vocational Course—LINEAR INTEGRATED CIRCUITS

(For the Vocational Subject – Applied Electronics of Model-II Physics)

[2013 Admissions onwards]

Time : Three Hours Maximum : 60 Marks

Part A (Short Answer Questions)

Answer **all** *questions.*
1 *mark each.*

1. How can we fabricate transistor in an IC ?
2. What are the advantages of Integrated Circuits ?
3. Explain the concept of virtual ground in OP AMP.
4. What is the significance of a voltage follower ?
5. What is a comparator ?
6. Write the principle of Notch filter.
7. List important features of the 555 timer.
8. What is a phase locked loop ?

(8 × 1 = 8 marks)

Part B (Brief Answer Questions)

Answer any **six** *questions.*
2 *marks each.*

9. Briefly explain about the complete monolithic integrated circuits.
10. Compare the different types of ICs.
11. Write short note on :
    (i) Epitaxial layer ;
    (ii) IC packages.
12. What are the OP AMP parameters ?
13. What are the characteristics of an Ideal OP AMP ?
14. Briefly explain the frequency response of an OP AMP.

Turn over

15. Explain the difference between the integrator and differentiator and give one application each.
16. Draw the circuit diagram of a Wein–Bridge oscillator.
17. Briefly explain die role of a low-pass filter and VCO in PLLs.
18. Explain one application each in Which the 555 can be used as a mono stable and astable multi vibrator.

(6 × 2 = 12 marks)

Part C (Problem/Descriptive)

Answer any **four** *questions.*
4 marks each.

19. Describe the photolithographic method to fabricate monolithic ICs.
20. What are the differences between the triangular and saw tooth wave forms ? How can a triangular wave generator be converted into a saw tooth wave generator ?
21. Discuss the frequency response of an operational amplifier.
22. In an inverting OP AMP, R_1 = 1 kΩ and R_f = 1 MΩ. Assuming an ideal amplifier, determine :
    (a) Voltage gain ; (b) Input resistance and ;
    (c) Output resistance.
23. Explain the working of Schmitt Trigger.
24. Discuss how FM demodulation can be achieved using PLL.

(4 × 4 = 16 marks)

Part D (Long Answer / Problem Questions)

Answer any **two** *questions.*
12 marks each.

25. What is an operational amplifier ? Discuss its applications.
26. Give a detailed description of active filters. Explain the working of low pass ; high pass and band pass filters with neat diagram.
27. Draw the circuit of a triangular wave generator using OPAMP and with appropriate wave forms, explain its working.
28. How the components :
    (i) FET ; (ii) diode ;
    (iii) resistor and (iv) capacitor are fabricated on IC ?

(2 × 12 = 24 marks)