



K22U 0141

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS – Supple./Improv.)

Examination, April 2022

(2016-2018 Admissions)

CORE COURSE IN PHYSICS

6B14PHY : Electronics – II

Time : 3 Hours

Max. Marks : 40

SECTION – A

(Answer **all** – very short answer type – **each** question carries **1** mark)

1. The input impedance of a CE amplifier is \_\_\_\_\_
2. Oscillator employes \_\_\_\_\_ feedback.
3. The gain of an ideal OP-amp is \_\_\_\_\_
4. The inputs to an XOR gate is 1, 0 and 1, the output will be \_\_\_\_\_

SECTION – B

(Answer **any seven** – short answer type – **Each** question carries **two** marks)

5. What do you mean by operating point ?
6. What is Barkhausen criterion ?
7. Explain why common collector circuit is not used for amplification purpose.
8. What is the need of negative feedback in an op-amp ?
9. What is a QUAD in a Karnaugh map ?
10. Define open loop gain and closed loop gain.
11. What are encoders and decoders ?
12. What is the purpose of a coupling capacitor in a transistor amplifier ?
13. State De-Morgan's first and second theorem.
14. Draw a half adder circuit. What is the Boolean equation for CARRY and for SUM in a half adder ?

P.T.O.



## SECTION – C

(Answer **any four** – short essay/problem – **Each** question carries **three** marks)

15. A transistor used in CE connection has the following set of h parameters when the dc operating point is  $V_{CE} = 5$  volts and  $I_C = 1$  mA,  $h_{ie} = 1700\Omega$ ,  $h_{oe} = 6 \times 10^{-6} \Omega$ ,  $h_{re} = 1.3 \times 10^{-4}$ . If the ac load  $r_L$  seen by the transistor is  $2\text{ K}\Omega$ , find the (i) input impedance (ii) current gain (iii) voltage gain.
16. Derive an expression for the output voltage of an OP-AMP as summing amplifier.
17. Simplify the expression :  $X = \bar{A}\bar{B}C + A\bar{B}C + AB\bar{C} + ABC$ .
18. Calculate the operating frequency and feedback fraction of a Hartley oscillator. given  $L_1 = 1\text{ mH}$ ,  $L_2 = 0.1\text{ mH}$ ,  $C = 10\text{ pF}$ . The mutual inductance between the coils,  $M = 0.02\text{ mH}$ .
19. A class A amplifier has a transformer as the load. If the transformer has a turn ratio of 10 and the secondary load is  $100\Omega$ , find the maximum ac power output. Given that zero signal collector current is  $100\text{ mA}$ .
20. Explain the three basic logic gates with proper truth table.

## SECTION – D

(Answer **any two** – Long essay type – **each** question carries **five** marks)

21. Draw the circuit of a single stage CE amplifier. Explain the function of each component in the circuit. Also show that the output is  $180^\circ$  out of phase with the input.
22. Explain Karnaughmap simplification with examples of pairs, quads and octets.
23. What are the ideal characteristics of an op amp ? Also discuss the working of an op-amp integrator.
24. With the help of a neat diagram, explain the phase shift oscillator and mention the advantages and disadvantages.