K24U 0406

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree (C.B.C.S.S. – Supplementary/One Time Mercy Chance) Examination, April 2024
(2014 to 2018 Admissions)
CORE COURSE IN PHYSICS
6B14PHY : Electronics – II

Time : 3 Hours Max. Marks : 40

Instruction : *Write answers in English* ***only***.

SECTION – A

(Answer **all** – Very short answer type – **Each** question carries **one** mark.)

1. The maximum efficiency for a practical class A amplifier is _____%.
2. In Boolean algebra $A + \overline{A} =$ _____
3. The point where the dc load line intersects the $I_B = 0$ is called
4. For a transistor, the value of α is 0.9 then the value of β is **(4×1=4)**

SECTION – B

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

5. What is the purpose of bypass capacitor in CE configuration ?
6. Describe the term feedback in amplifiers.
7. What is an Op-Amp ?
8. Give the Barkhausen condition for getting sustained oscillations.
9. Explain frequency response.
10. What is meant by the operating point ?
11. Sketch the circuit of a Wein bridge oscillator.

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12. What are comparators ?
13. Determine the values of A, B, C and D that make the product term $A\,\overline{B}\,C\,\overline{D} = 1$.
14. Find the decibel gain of power gain 160. **(7×2=14)**

SECTION – C

(Answer **any four** – Short essay/problem type – **Each** question carries **three** marks.)

15. Sketch the circuit of an OP-Amp differentiator. Write down the expression for the output.
16. The voltage gain of the amplifier without feedback is 200. If 10% negative feedback is employed, calculate the voltage gain with feedback.
17. What are the advantages of negative feedback ?
18. Convert the Boolean expression to SOP from $\overline{\overline{(A + B)} + C} =$
19. For a single stage transistor amplifier $R_C = 2\ K\Omega$ and input resistance $R_i = 1\ K\Omega$. If the current gain is 50, calculate the voltage gain.
20. Distinguish between Inverting and Non-inverting amplifiers using figures. **(4×3=12)**

SECTION – D

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

21. State and prove Demorgan's theorems in Boolean algebra.
22. With a neat diagram explain the working of a Hartley oscillator and derive the expression for frequency.
23. Draw the block diagram of a full adder and write down its truth table.
24. Use a Karnaugh map to minimize the following standard SOP expressions

$\overline{A}\,\overline{B}\,\overline{C}\,D + \overline{A}\,\overline{B}\,C\,D + \overline{A}\,B\,\overline{C}\,D + A\,\overline{B}\,\overline{C}\,\overline{D} + A\,\overline{B}\,\overline{C}\,D + \overline{A}\,\overline{B}\,\overline{C}\,D + A\,B\,C\,D + A\,\overline{B}\,C\,D.$

(2×5=10)