



K25U 2361

Reg. No. :

Name :

V Semester B.Sc. Degree (CBCSS-OBE-Regular/Supplementary/
Improvement) Examination, November 2025
(2019 to 2023 Admissions)
CORE COURSE IN PHYSICS
5B09PHY : Electronics – II

Time : 3 Hours

Max. Marks : 40

PART – A

Short answer questions. Answer **all** questions. **Each** question carries **1** mark.

1. List the main difference between Class A and Class B power amplifiers.
2. Give one application of an op-amp integrator circuit.
3. What is the main function of a comparator circuit ?
4. Write the truth table of a 2-input NAND gate.
5. What are the input terminals of an op-amp ?
6. What is the purpose of a coupling capacitor in a transistor amplifier ? (6×1=6)

PART – B

Short essay questions. Answer **any 6** questions. **Each** question carries **2** marks.

7. Draw the circuit diagram of a capacitor-coupled two-stage Common Emitter amplifier and explain it.
8. Mention the essential conditions to be satisfied by an oscillator circuit.
9. What is a Quad and Octet in a K-Map ?
10. Give the Truth table of a full adder.
11. Define positive feedback.

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12. What is the difference between a half adder and a full adder ?
13. What are the advantages of negative feedback in amplifiers ?
14. What is a Comparator ?

(6×2=12)

PART – C

Problems. Answer **any four** questions. **Each** question carries **3** marks.

15. A common emitter amplifier circuit has a load resistance, R_L of $1.2\text{ k}\Omega$ and a supply voltage of 12V . Calculate the maximum Collector current (I_c) flowing through the load resistor when the transistor is switched fully "ON" (saturation), assuming $V_{ce} = 0$.
16. Simplify the following Boolean function using a two-variable Karnaugh Map $f(A, B) = \sum (1, 2, 3)$. Then, write the final simplified expression.
17. Explain the working principle of a Wien-Bridge oscillator with a neat circuit diagram.
18. Define SOP (Sum of Products) and POS (Product of Sums) forms of a Boolean expression. Explain how a standard SOP expression is converted into a standard POS expression.
19. In a transistor circuit, the collector load is $4\text{ k}\Omega$, whereas the quiescent current (zero signal collector current) is 1 mA .
 - i) What is the operating point if $V_{cc} = 10\text{ V}$
 - ii) What will be the operating point if $R_c = 5\text{ k}\Omega$?
20. Compare Class A, Class B and Class C amplifiers.

(4×3=12)

PART – D

Long essay questions. Answer **any 2** questions. **Each** question carries **5** marks.

21. Explain with neat diagrams how a 4-bit parallel adder works.
22. With a neat circuit diagram, explain the working of a Colpitts oscillator. Write the expression for the frequency of oscillation.
23. Convert the Boolean expression $\bar{A} + B\bar{C}A + B\bar{C}A + BC$ into SOP form. Describe the rules for grouping '1's that are used for the solution.
24. Discuss the op-amp as a Voltage Amplifier and Summing amplifier. (2×5=10)