



K25U 0841

Reg. No. :

Name :

IV Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/
Improvement) Examination, April 2025
(2019 to 2023 Admissions)
CORE COURSE IN PHYSICS
4B04PHY : Electronics – 1

Time : 3 Hours

Max. Marks : 40

SECTION – A

Short answer questions. Answer **all** questions, **each** carries **one** mark.

1. What is the Zener breakdown voltage ?
2. What is transistor biasing ?
3. Why is biasing necessary in a transistor ?
4. How is a JFET normally biased ?
5. How do you convert a decimal number to binary ?
6. What is the importance of logic gates ?

(6×1=6)

SECTION – B

Short essay questions. Answer **any six** questions, **each** carries **two** marks.

7. Define the efficiency of a full wave rectifier and explain how it is calculated ?
8. What are the characteristics of Zener diode ?
9. Why is thermal stability important in bias circuits for BJTs ?
10. Why CE configuration is commonly used ?
11. What are the transfer characteristics of a Depletion-Mode MOSFET ?
12. Draw the symbol of NAND gate and write down its truth table.
13. Explain De-Morgan's theorem.
14. Explain the Identity and Idempotent Laws of Boolean algebra.

(6×2=12)

P.T.O.

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SECTION – C

Problems. Answer **any four** questions, **each** carries **three** marks.

15. An ac voltage of peak value 20V is connected in series with silicon diode and load resistance of 500Ω . If the forward resistance of the diode is 10Ω . Find the peak current through the diode and peak output voltage.
16. In a common base connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current.
17. A Germanium transistor is to be operated at zero signal $I_C = 1\text{mA}$. If the collector supply $V_{CC} = 12\text{V}$, what is the value of R_B in the base resistor method ? Given $\beta = 100$.
18. A JFET has the following parameters; $I_{DSS} = 32\text{mA}$; $V_{GS(off)} = -8\text{V}$; $V_{GS} = -4.5\text{V}$. Find the value of drain current.
19. Convert $(B2F)_{16}$ to octal.
20. Simplify the following Boolean expression.
 $Y = (A + B + C) \cdot (A + B)$

(4×3=12)

SECTION – D

Long essay. Answer **any two** questions, **each** carries **five** marks.

21. Draw the circuit diagram and explain the working of a half wave rectifier.
22. Explain the input and output characteristics of common base transistor characteristics.
23. What is meant by transistor biasing ? Explain the voltage divider bias used in transistors.
24. Explain the construction and working principle of a MOSFET.

(2×5=10)