



K26U 0860

Reg. No. :

Name :

Second Semester B.Sc. Degree (C.B.C.S.S. – OBE-Supplementary)
Examination, April 2026
(2020 to 2023 Admissions)

COMPLEMENTARY ELECTIVE COURSE IN PHYSICS
2C02PHY : Electricity, Magnetism and Thermodynamics

Time : 3 Hours

Max. Marks : 32

PART – A

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

1. Define the temperature coefficient of resistance. Give one example each for positive and negative temperature coefficients.
2. Write the mathematical form of the first law of thermodynamics.
3. Define isothermal elasticity.
4. State Biot-Savart's formula in vector form.
5. Write the relation between three magnetic vectors-B, H & M. (5×1=5)

PART – B

Short essay questions. Answer **any 4** questions. **Each** question carries **2** marks.

6. How will you determine figure of merit of a ballistic galvanometer ?
7. Explain the working of a refrigerator.
8. Write an expression for torque on a current-carrying loop in a uniform magnetic field.
9. Obtain the expression for work done during an isothermal process.
10. Distinguish between ferromagnetism and anti-ferro magnetism.
11. Write a short note on Searle's vibration magnetometer. (4×2=8)

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PART – C

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

12. The efficiency of a Carnot engine is 10% is used as a refrigerator. Find the coefficient of performance.
13. An ideal gas at S.T.P. isothermally compressed to $\frac{1}{4}$ of its original value. Find the resultant pressure.
14. Calculate the work done when a gram molecule of an ideal gas at S.T.P. expands adiabatically so that its temperature falls from 27 °C to 10 °C.
15. A wire shaped to a regular hexagon of side 2 cm carries a current of 2A. Find the magnetic induction at the center.
16. In an experiment with Carey foster's bridge the shift in the balance point is 2.4 cm when a thick copper strip and 1 Ω resistance interchanged. The 1 Ω is replaced by an unknown resistance. Now balancing point shifts by 10 cm on interchanging. Calculate the unknown resistance. (3×3=9)

PART – D

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

17. State and prove Carnot's theorem.
18. Derive an expression for magnetic field intensity on the axis of a current-carrying circular coil.
19. How a moving coil galvanometer is converted into an ammeter and voltmeter ?
20. Explain with a suitable diagram, how a box-type vibration magnetometer is used for comparing the magnetic moment of two bar magnets. (2×5=10)