K24U 1629

Reg. No.: .....

Name : .....

Second Semester B.Sc. Degree (CBCSS – OBE-Regular/Supplementary/ Improvement) Examination, April 2024
(2019 Admission Onwards)
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. What is diamagnetism ? Give two examples.
2. State first law of thermodynamics.
3. Write down the expression for magnetic induction at a point due to a straight current carrying conductor. Give its unit.
4. What is Lorentz force ? Write down Lorentz force formula for a charged particle.
5. Define thermodynamic equilibrium. **(5×1=5)**

PART – B

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

6. Write a note on ferromagnetism.
7. Briefly explain a Carnot's engine.
8. How is a potentiometer used to calibrate an ammeter ?
9. What is a thermodynamic system ? Give an example.
10. State Biot-Savart Law.
11. What is the working principle of a moving coil ballistic galvanometer ? **(4×2=8)**

P.T.O.

PART – C

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

12. A Carnot engine is working between 300°C and 1000°C. Calculate the increase in efficiency if temperature of the source is raised by 200°C.

13. An iron rod of volume 10^{-3} m^3 and relative permeability 1000 is placed as the core in a solenoid with 10 turns per cm. Let a current of 0.5 A is passed through the solenoid. Calculate the magnetic moment of the rod.

14. A Carnot engine working between 300 K and 600 K has a work output of 800 J per cycle. What is the amount of heat energy supplied to the engine from source per cycle ?

15. If 8 A of current flows in the first wire, 11 A of current flows in the second wire. The distance between the two wires is 15 m. Find the magnetic force between the two wires.

16. One mole of oxygen gas expands isothermally to four times its initial volume. Calculate the increase in entropy. Given R = 8.314 J $mol^{-1}K^{-1}$. **(3×3=9)**

PART – D

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

17. Obtain an expression for magnetic induction at a point on the axis of a circular coil.

18. What is a Carey Foster bridge ? How is it used to determine the resistance ?

19. Explain the features of adiabatic process. Obtain the expression for work done during an adiabatic change.

20. Compare diamagnetism, paramagnetism and ferromagnetism with examples. **(2×5=10)**

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