K22U 1070

Reg. No. : .....

Name : .....

II Semester B.Sc. Degree (CBCSS – Supplementary) Examination, April 2022
(2016 – 2018 Admissions)
COMPLEMENTARY COURSE IN PHYSICS
2C02PHY : Electricity, Magnetism and Thermal Physics

Time : 3 Hours Max. Marks : 32

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

SECTION – A

Very short answer type. **Each** carries **1** mark. Answer **all 5** questions.

1. _____ is the principle of Carey Foster bridge.
2. Entropy is a measure of
3. During an isobaric process _____ is constant.
4. The unit of current sensitivity is
5. The time constant of L-R circuit is **(5×1=5)**

SECTION – B

Short answer type. **Each** carries **2** marks. Answer **4** questions out of 6.

6. State the conditions under which a moving coil Galvanometer is ballistic.
7. State the first law of thermodynamics and express it in the differential form.
8. Distinguish between reversible and irreversible process.
9. What is Lorentz force ? What are the conclusions that we can draw from magnetic Lorentz force ?
10. When an LCR circuit is said to be critically damped and over damped ?
11. A potentiometer is the best instrument to measure the e.m.f. of a cell. Why ?

(4×2=8)

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SECTION – C

Short essay/problem type. **Each** carries **3** marks. Answer **3** questions out of 5.

12. Derive an expression for the force on a current carrying conductor placed in a magnetic field.
13. An inductance of 500 mH and a resistance of 5Ωs are connected in series with an e.m.f. of 10 volts. Find the final current. If now the cell is removed and the two terminals are connected together, find the current after 0.05 sec.
14. Show that adiabatic elasticity is γ times isothermal elasticity.
15. In an experiment with Carey Foster Bridge, the shift in the balance point is 5.4 cm when a thick copper strip and 1Ω resistance are interchanged. The 1Ω resistance is then replaced by an unknown resistance. Now the balance point shifts by 10 cm on interchanging. Calculate the unknown resistance.
16. Explain how charge sensitiveness and current sensitiveness are determined using a ballistic galvanometer. **(3×3=9)**

SECTION – D

Long essay type. **Each** carries **5** marks. Answer **2** questions out of 4.

17. State the second law of thermodynamics. Describe the working of an ideal heat engine and derive an expression for efficiency of the engine.
18. State Biot - Savart law. Using Biot - Savart law, calculate magnetic induction due to a current in a circular coil of wire at a point on its axis.
19. Derive an expression for the growth and decay of charge in a capacitor through a resistance.
20. Explain the theory of potentiometer. How will you use it to calibrate an ammeter and a voltmeter ? **(2×5=10)**