



K20U 0320

Reg. No. : .....

Name : .....

II Semester B.Sc. Degree (CBCSS-Supplementary/Improvement)

Examination, April 2020

(2014-2018 Admissions)

COMPLEMENTARY COURSE IN PHYSICS

2C02 PHY : 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. The physical quantity that determines whether a system is in thermal equilibrium with another system is \_\_\_\_\_
2. The increase of resistance per unit original resistance per degree rise of temperature is called \_\_\_\_\_
3. The concept of entropy was introduced by \_\_\_\_\_
4. A charge  $q$  moves with a velocity  $v$  through a region where both electric field  $E$  and magnetic field  $B$  are present, then the resultant force  $F$  on the moving charge is \_\_\_\_\_
5. The unit of  $\sqrt{LC}$  is \_\_\_\_\_ (5×1=5)

SECTION – B

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

6. State Biot – Savart law in vector form.
7. Distinguish between B.G and dead – beat Galvanometers.
8. What is the time constant for a CR circuit ?
9. State the zeroth law of thermodynamics.
10. Define entropy. Explain the physical significance of entropy.
11. What is a thermodynamic process ? Give examples. (4×2=8)

P.T.O.



## SECTION - C

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

12. Briefly explain the theory of a potentiometer.
13. Calculate the value of the torque on a current loop placed in a uniform magnetic field.
14. Derive an expression for the growth of current in a circuit containing a resistance and inductance.
15. Derive an expression for work done during an isothermal process.
16. What is a refrigerator ? Explain the principle of a refrigerator. (3×3=9)

## SECTION - D

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

17. Describe the working of a Carnot heat engine. Derive an expression for its efficiency.
  18. Explain the theory of a Carey Foster bridge. Define the temperature coefficient of resistance.
  19. Give the construction of a moving coil ballistic Galvanometer. Derive an expression between the quantity of charge flowing through it and the throw obtained. Show how to correct the observed throw for damping.
  20. A charged capacitor of capacitance  $C$  discharges through a circuit consisting of a coil of inductance  $L$  and a resistor  $R$ . Find the charge on the capacitor in  $t$  second after it starts discharging. Deduce the conditions under which the discharge is oscillatory. Find the period and frequency of the oscillatory discharge when  $R$  is very small. (2×5=10)
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