



K21U 3478

Reg. No. :

Name :

**II Semester B.Sc. Degree (CBCSS – OBE – Reg./Sup./Imp.)
Examination, April 2021**

(2019 Admission Onwards)

COMPLEMENTARY ELECTIVE COURSE IN PHYSICS

2C02PHY : Electricity, Magnetism and Thermodynamics

Time : 3 Hours

Max. Marks : 32

PART – A

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

1. Define Magnetic susceptibility.
2. Write down the expression for force between two magnetic poles.
3. What is antiferromagnetism ?
4. State Biot-Savart law.
5. Define Lorentz force.

(5×1=5)

PART – B

Answer **any 4** questions. **Each** carries **2** marks.

6. Distinguish between diamagnetic and paramagnetic materials.
7. Explain how moving coil galvanometer can be converted into voltmeter.
8. Derive the expression for force on a current carrying conductor in a magnetic field.
9. Explain the construction of moving coil ballistic galvanometer.
10. What is the difference between open and closed system ? Give an example.
11. What do you understand by the internal energy of a system ? State first law of thermodynamics.

(4×2=8)

P.T.O.

K21U 3478



PART – C

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

12. A circular coil of radius 0.1 m carries a current 1A produces a flux density of 20×10^{-4} tesla at the centre of the coil. Calculate the number of turns of the coil.
13. You are supplied with a galvanometer of range 10 mA and resistance 100 Ω . How would you convert it into an ammeter to read upto 1 A ?
14. The magnetic susceptibility of silicon is -0.4×10^{-5} . Calculate the flux density and magnetic moment per unit volume when a magnetic field of intensity 5×10^5 A/m is applied.
15. A quantity of air at 27°C and 1 atmospheric pressure is suddenly compressed to half its original volume. Find the change in temperature.
16. Find the efficiency of Carnot's engine working between the steam point and ice point. **(3×3=9)**

PART – D

Answer **any 2** questions. **Each** carries **5** marks.

17. Explain the theory of potentiometer. How will you use it to calibrate an ammeter ?
 18. Calculate the value of magnetic field due to an infinitely long straight wire carrying a current i ampere at a distance 'a' from the wire.
 19. Describe Carnot's cycle and obtain an expression for the efficiency of an ideal heat engine working between two temperatures T_1 and T_2 .
 20. Define entropy. Prove that in a cycle of reversible process the total change in entropy is always zero. **(2×5=10)**
-