41239

(Pages : 2)

Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2023

Physics/Applied Physics

PHY 4C 04—ELECTRICITY MAGNETISM AND NUCLEAR PHYSICS

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

The symbols used in question paper have their usual meanings.

Section A (Short Answer Type)

Answer **all** *questions in two* **or** *three sentences.*
Each correct answer carries a maximum of 2 marks.

1. What do you mean by electrostatic shielding ?
2. Define the term current density. What is its unit ?
3. Write down the equation of continuity in electricity. What does it mean ?
4. What is the use of a potentiometer ?
5. What do you mean by the term angle of declination ? How is it expressed ?
6. Give any four properties of diamagnetic materials.
7. What is the use of a deflection magnetometer ? How will you arrange a deflection magnetometer in tan A position ?
8. What is the principle of C_{14} dating ?
9. What are primary cosmic rays ? What is its content ?
10. What are elementary particles ? Give an example.
11. What do you mean by hadron ? Give an example.
12. Give the features of Higg's boson.

(Ceiling - 20)

Turn over

Section B (Paragraph/Problem Type)

Answer **all** *questions in* **a paragraph** *of about* **half a page to one page.**
Each correct answer carries a maximum of 5 marks.

13. It is required to construct a parallel plate capacitor of capacitance 0.5 μF using paper she thickness 4×10^{-5} m as the dielectric. How many circular metal foils of radius 2×10^{-1} m required ? Given, the relative permittivity of paper is 5 and $\varepsilon_0 = 8.9 \times 10^{-12}$ F/m.

14. The resistance of a galvanometer is 100 ohms. It gives full scale deflection for a current of 1 ampere. How will you convert it to a voltmeter of range 50 volts ?

15. In an experiment with Carey Foster bridge, the shift in the balance point is 5.4 cm when the copper strip and the one ohm resistance are interchanged. The one ohm resistance is then rep by an unknown resistance. Now the balancing point shifts by 10 cm on interchanging. Deter the unknown resistance.

16. Draw a typical hysteresis curve and indicate the magnetic saturation, retentivity and coerciv a ferromagnetic material.

17. Using a suitable figure, explain the arrangement of a Searle's vibration magnetometer. Gi application of a Searle's vibration magnetometer.

18. Estimate the binding energy of $^{12}_{6}C$ nucleus. Also determine its density.

19. Discuss briefly the fundamental interactions in nature indicating the exchange particles.

(Ceiling

Section C (Essay Type)

Answer in about **two pages,** *any* **one** *question.*
Answer carries 10 *marks.*

20. Explain Gauss's law in electrostatics. Obtain an expression for the electric field due to an in plane sheet of charge.

21. What do you mean by radioactivity ? Explain the properties of alpha, beta and gamma radia

$(1 \times 10 = 10$ m