

22U404

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Name:

Reg.No:

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY4 C04 / CC20U PHY4 C04 - ELECTRICITY, MAGNETISM AND NUCLEAR PHYSICS

(Physics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. State and explain Coulomb's inverse square law in electrostatics.
2. What is electrostatic shielding? Mention one practical application.
3. A parallel plate capacitor has a capacitance of 1F. The plates are separated by 1cm. Then what must be the area of each plate?
4. Define conductance and conductivity.
5. What are superconductors? Give examples.
6. What are ferromagnetic substances? Give examples.
7. Define reduction factor of TG. How does the sensitivity of TG depend on its reduction factor?
8. What do you mean by saturation property of nuclear forces?
9. Mention four properties of beta rays.
10. Mention any two methods of disposal of nuclear wastes.
11. What are Cosmic rays?
12. Explain briefly about LHC.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Explain in detail how a potentiometer is used to measure the resistance of a coil?
14. What is a Carey foster bridge? What is its principle?
15. Derive the relation between relative permeability and magnetic susceptibility.

16. In tan A position a short magnet is placed at a distance d_1 from the centre of the compass box of a deflection magnetometer. When the same magnet is placed at a distance d_2 from the compass box in tan B position of the magnetometer, the deflection remains same. Find the ratio (d_1/d_2)
17. Explain the theory behind Hydrogen bomb.
18. What are the advantages of cyclic accelerators over a linear one?
19. Explain the quark hypothesis.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. State and explain Gauss's theorem in electrostatics. Find out the field due to a uniform plane sheet of charge.
21. Write the properties of nuclear forces and explain briefly Nuclear fission and fusion.

(1 × 10 = 10 Marks)
