19U404 (Pages: 2) Name: ....

Reg.No: ....

(CBCSS - UG)

CC19U PHY4 C04 - ELECTRICITY, MAGNETISM AND NUCLEAR PHYSICS

(Physics - Complementary Course)

(2019 Admission - Regular)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. State and explain superposition principle.

2. What are dielectrics? Define dielectric constant of a meterial

3. What is superconductivity.

4. What is a potentiometer. Give its principle.

5. What are the magnetic elements of earth? Define them.

6. What is meant by hysteris loss

7. Define reduction factor of TG. How does the sensitivity of TG depend on its reduction factor?

8. How nucleus is stable?

9. Write down the fission reaction of U-235. How much energy is released per fission.

10. Mention any two methods of disposal of nuclear wastes.

11. What is meant by cascade theory of cosmic rays?

12. Explain briefly about LHC.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Prove Coulomb's law from Gauss's law.

14. Discribe the principle of a Capacitor.

15. A current of 5 ampere is passing through a metallic wire of cross sectional area 4 x 10^-3 m2. if the density of the charge carrier in the wire is 5 x 10^26 m-3. find the drift speed of electrons.

16. In tan A position a short magnet is placed at a distance d1 from the centre of the compass box of a deflection magnetometer. When the same magnet is placed at a distance d2 from the compass box in tan B position of the magnetometer, the deflection remains same. Find the ratio(d1/d2)

17. Explain the theory behind Hydrogen bomb.

18. Determine the amount of having activity equal to 5 millicurie. The half life of Po is 138 days

19. Write a short note on hadrons.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. What is a potentiometer. Give its principle. Explain in detail how a potentiometer is used to measure the resistance of a coil.

21. (a) With a neat diagram explain the working principle of a linear accelerator.

    (b) Derive an expression for the final kinetic energy acquired by the accelerated particles.

    (c) What are the limitationsof this accelerator

(1 × 10 = 10 Marks)

****