C 26045

Name..

Reg. No. . . . .

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, MAY 2012

(CCSS)

Physics—Complementary Course

PH 4C 07—ELECTRICITY, MAGNETISM AND NUCLEAR PHYSICS

Time : Three Hours   Maximum 30 Weightage

Section A

I. Answer all *twelve* questions.

1. The work done in moving a charge between two equipotential points ————

2. Resistance inversely proportional to :

   (a) Length.   (b) Area of cross—section.

   (c) Density.

3. Total normal electric lines of force passing through a given area is

4. What is the unit of temperature coefficient of resistance ?

5. In a ferromagnetic material, magnetic susceptibility is

6. Temperature Coefficient of resistance is positive for

   (a) Metals.   (b) Semi conductors.

   (c) Insulators.

7. State an application of Carey foster bridge.

8. Nuclear fission reaction require   energy compared with nuclear fusion.

   (a) More.   (b) Less.

   (c) Equal.

9. In atom bomb explosion, what nuclear reaction takes place ?

10. Charge of particles in 7 —radiation is _____

    (a) Positive.   (b) Negative.

    (c) No change.

11.   is an example for leptons.

    (a) Electron.   (b) Proton.

    (c) Pion.

12. Mention a unit of radioactivity.

(12 x a = 3 weightage)

Section B

II. Short answer type questions. (Answer all *nine* questions) :

13. What is a shunt resistance ?

14. What are superconductors ? Give example.

15. What is meant by dip ?

16. Mention '4' properties of a —rays.

17. What is tan C position of deflection magnetometer ?

18. Differentiate between half life and mean life periods.

19. Write a note on Hibb's Boson.

20. Give some properties of ferromagnetic substance.

21. What are quarks ?

(9 x 1 = 9 weightage)

Section C

III. Short essay *or* paragraph questions. (Answer any *five* questions from seven) :

22. Compare between Coulomb's force and strong nuclear force.

23. Obtain the relation between B, B_H and B_V.

24. Find the electric force on a proton placed in an electric field of 2×10^4 N/C along the positive X–direction.

25. The half life of a radioactive sample is 4 days. What fraction of 1 gm sample will remain after 20 days?

26. Write a note on Cosmic rays.

27. How galvanometer, ammeter and voltmeter differ ?

28. Two capacitors 4 μF and 6 μF charged to the potential of 20 volts and 24 volts respectively are connected in parallel. Find their common potential and loss of energy.

(5 x 2 = 10 weightage)

Section D

IV. Essay questions. (Answer any *two* questions from three) :

29. State and prove Gauss's theorem. Apply it to find electric field due to plane sheets of charge.

30. Describe earth's magnetic and magnetic elements of earth. Give the relation between them.

31. Write a note on quarks, colour and flavour and define Higg's boson.

(2 x 4 = 8 weightage)