C 81848 **(Pages : 2)** **Name.....**

Reg. No.....

FOU El SEMESTER B.Sc. DEGREE EXAMINATION, APRIL/MAY 2015

(UG—CCSS)

Complementary Course—Physics

4C 07—ELECTRICITY, MAGNETISM AND NUCLEAR PHYSICS

(2009-2012 Admissions)

Time : Three I airs **Maximum : 30** Weightage

Section A

I. Answe *all* **12 questions :**

1 As distance **between two charges is doubled force between them becomes _____**

2 On an equipotential **surface, potential difference between two points is _____**

3 Which one is a unit of potential ?

(a) J/C. **(b)** N/C.

(c) NC. **(d)** JC.

4 Resistivity of a metal wire depend on :

(length, area of cross-section, both length and area, none of the above)

5 A galvanometer is converted into a voltmeter by connecting a resistance in _____

6 In a diamagnetic material magnetic susceptibility **is _____**

7 In a stable nucleons, mass of nucleons, is _____ than mass of nucleus.

8 In a cyclotron, field applied is :

(E only, B only, E and B, none of the above)

9 In a nuclear reactor, _____ slows down the highly energetic neutrons.

10 Protons and neutrons are :

(a) Leptons. **(b) Mesons.**

(c) Baryons.

11 What are the original three quarks ?

12 The nuclear reaction taking place in hydrogen bomb is _____

(12 x = 3 weightage)

Turn over

Section B

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

13 How can we convert a galvanometer into an ammeter ?

14 Draw the schematic diagram of Carey Foster bridge.

15 What is tan A position of deflection magnetometer ?

16 What is declination ?

17 How nucleus is stable ?

18 Mention four properties of β-rays.

19 Explain lattitude effect.

20 Controlled nuclear reaction is difficult in practice-Why ?

21 Write a note on carbon dating.

(9 x 1 = 9 weightage

Section C

III. Short essay or paragraph questions. Answer any *five* questions from 7 :

22 Two equal charges placed at distance of 1 m repel each other by a force of 9×10^{-3} N. Find the magnitude of charge.

23 Explain with a practical application, electrostatic shielding.

24 A galvanometer has resistance of $30\,\Omega$ and current of $2\,mA$ is needed to give full scale deflection. What is the resistance needed and how is it to be connected to convert the galvanometer's ?

(a) into ammeter of 0.3 amperes.

(b) into voltmeter of 0.2 V range.

25 Briefly explain the origin of universe.

26 A tangent galvanometer has coil 50 turns of mean radius 10cm. If the value of B_H at a place is 0.3 G. Calculate the current in ampere to produce a deflection 45°.

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

28 Write a note on Cosmic rays.

(5 x 2 = 10 weightage)

Section D

IV. Essay questions. Answer any *two* questions from 3 :

29 State Gauss's theorem. Derive equation for electric field intensity due to two parallel sheets of charge.

30 Write and explain the principle of potentiometer. How can we measure resistance using potentiometer ?

31 Write and explain the working of a cyclotron.

(2 **x 4** = 8 weightage)