

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

Physics

PHY 4C 04—ELECTRICITY MAGNETISM AND NUCLEAR PHYSICS

Time : Three Hours

Maximum : 64 Marks

I. Answer *all* questions, each question carries 1 mark :

- 1 A hollow sphere of copper is positively charged. Then the electric field inside the sphere is _____.
- 2 A charge Q is divided into two parts and the two parts are separated by a certain distance. The force between them will be maximum if one of the charges is _____.
- 3 If electric field is uniform, electrical lines of force are _____.
- 4 Three resistors 2Ω , 3Ω , and 5Ω are connected in parallel across a battery of 10 V and of negligible internal resistance. The potential difference across the 3Ω resistor is _____.
- 5 If a wire is stretched to make it 0.1 % longer, the percentage change in its resistance would be _____.
- 6 The unit of magnetic induction in SI system is _____.
- 7 The arms of a deflection magnetometer in broadside on position are placed along _____.
- 8 The energy generation in Sun and Stars is mainly due to _____.
- 9 The half life of radium is 1600 years. The fraction of the sample that would remain after 6400 years is _____.
- 10 A neutrino is an elementary particle, having _____ mass and _____ charge.

(10 × 1 = 10 marks)

II. Answer all *seven* questions, each question carries 2 marks :

- 11 List the factors affecting capacitance of a capacitor.
- 12 What is superconductivity ?
- 13 Define temperature coefficient of resistance.
- 14 What is hysteresis ?

Turn over

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2020

Physics/Applied Physics

PHY 4C 04—ELECTRICITY MAGNETISM AND NUCLEAR PHYSICS

Time : Three Hours

Maximum : 64 Marks

Section A (One Word)*Answer all questions.**Each question carries 1 mark.*

1. If the radius of a wire of constant length is doubled, its resistance becomes _____.
2. When the temperature of a conductor is increased, its resistance _____.
3. The direction of magnetic lines of force is from _____.
4. The angle of dip at earth pole is _____.
5. The principle of Carey Foster's bridge is _____.
6. For diamagnetic material, the value of χ is _____.
7. The unit of magnetic flux density is _____.
8. The energy released by the nuclear bomb that destroyed Hiroshima was equivalent to 12.4 kilotons of TNT. This is equivalent to $9.0 \cdot 10^{26}$ MeV. The mass that was converted into energy in this explosion was _____.
9. 1 Curie = _____ radioactive decay per second.
10. Particles that participate in the strong nuclear interaction are called _____.

(10 × 1 = 10 marks)

Section B (Short Answer Questions)*Answer all questions.**Each question carries 2 marks.*

11. What do you mean by electrostatic shielding ?
12. What do you mean by drift velocity ?
13. What is Hysteresis ?
14. Define reduction factor of a T G.
15. Write down any two characteristics of nuclear force.

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Name.....

Reg. No.....

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2022**

Physics/Applied Physics

PHY 4C 04—ELECTRICITY MAGNETISM AND NUCLEAR PHYSICS

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

Section A*Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Explain Gauss's law in electrostatics.
2. How will you define the potential difference between two points in an electric field ? What is its unit ?
3. What do you mean by a capacitor ? What are the factors on which the capacity of a capacitor depends on ?
4. Write down the expression connecting current density and drift velocity. What are the terms involved ?
5. What do you mean by angle of dip ? What is the angle of dip at the magnetic equator ?
6. Give any *four* properties of paramagnetic materials.
7. What is the use of a deflection magnetometer ? How will you arrange a deflection magnetometer in tan B position ?
8. What is the working principle of a tangent galvanometer ?
9. What do you mean by nuclear fission ? Give an example.
10. What are secondary cosmic rays ? What is its content ?
11. Give the quark composition of a proton and a neutron.
12. What is the purpose of large hadron collider ?

(8 × 3 = 24 marks)

Turn over

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Name.....

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FOURTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION, APRIL 2023

Physics/Applied Physics

PHY 4C04—ELECTRICITY MAGNETISM AND NUCLEAR PHYSICS

(2017—2018 Admissions)

Time : Three Hours

Maximum Marks : 64

Part A

Answer all questions.

Each question carries 1 mark.

1. What is the unit of relative permittivity ?
2. Unit of electric field intensity is _____.
3. When distance between two charges is doubled, force between them is _____.
4. Moment of inertia of a bar magnet of length 'l' and breadth 'b' is _____.
5. What is a beta particle ?
6. What is decay constant ?
7. The strongest force in the universe is _____.
8. Mention the principle of hydrogen bomb.
9. Becquerel is the unit of _____.
10. Electron is a having a spin _____.

(10 × 1 = 10 marks)

Part B (Short Answer Questions)

Answer all questions.

Each question carries 2 marks.

11. With equation define Coulomb's law.
12. What is the unit of capacitance ?
13. Explain the principle of nuclear bomb.
14. Write a note on carbon dating.
15. What is half life period ?
16. What are cosmic rays ?
17. Write note on quarks.

(7 × 2 = 14 marks)

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Name.....

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**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)

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