647510 **BSc6PhyC601x** **Seat No :_____**

B.Sc. Semester - 6 (*CBCS*) Examination
May/June-2021 (NEW COURSE)
Electrodynamics & Relativity (Core)

Time: 1:30 Hours **Marks: 42**

Instructions:

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1(A) **Answer The Following Questions. (Any Two Out of Three)** (10)

1. Explain the electric displacement and obtain the expression for Gauss's law in differential as well as integral form.
2. Explain the effect of magnetic field on atomic orbits with necessary equations.
3. Obtain expression of Ampere's law in magnetized material.

Q.1(B) **Answer The Following Questions. (Any One Out of Two)** (04)

1. Explain the polarization of matter.
2. Obtain the expression for torque acting on a magnetic dipole in a magnetic field.

Q.2(A) **Answer The Following Questions. (Any Two Out of Three)** (10)

1. Write Maxwell's equations and explain Maxwell's modification in Ampere's law
2. Explain poynting's theorem.
3. Write note on continuity equation.

Q.2(B) **Answer The Following Questions. (Any One Out of Two)** (04)

1. Explain Faraday's Lw
2. Explain Newton's third law in electrodynamics

Q.3(A) **Answer The Following Questions. (Any Two Out of Three)** (10)

1. Explain energy and momentum in electromagnetic waves.
2. Explain electromagnetic waves in vacuum.
3. Explain waves in one dimension.

Q.3(B) **Answer The Following Questions. (Any One Out of Two)** (04)

1. Explain sinusoidal waves.
2. Explain boundary condition for electromagnetic waves.

Q.4(A) **Answer The Following Questions. (Any Two Out of Three)** (10)

1. Explain Retarded potentials.
2. Write note on Jefimenko's Equations.
3. Explain Lienard – Wiechert potentials.

Q.4(B) **Answer The Following Questions. (Any One Out of Two)** (04)

1. Explain scalar and vector potentials.
2. Explain Gauge transformations.

Q.5(A) **Answer The Following Questions. (Any Two Out of Three)** (10)

1. Explain relativistic momentum and relativistic energy.
2. What is special theory of relativity and Write Einstein 's postulates
3. Explain Lorentz's transformations.

Q.5(B) **Answer The Following Questions. (Any One Out of Two)** (04)

1. Explain proper time and proper velocity.
2. Write note on relativistic dynamics.

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