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Seat No : _____

B.Sc. Semester - 1 (CBCS) Examination
Jan/Feb.-2022 (OLD COURSE)
PHYSICS (CORE)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figures 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 any one question. [7]
1. Explain vector product of two vectors.
 2. Derive an expression of growth and decay of charge in RC circuit.
- Q.1 (B) Answer any one question. [4]
1. Explain concept of voltage source.
 2. Explain the resolution of vectors.
- Q.1 (C) Answer any three questions. [3]
1. The dot product of two mutually perpendicular vectors is _____.
 2. Speed is a _____ quantity.
 3. The primary cells are not rechargeable. Is it true?
 4. A rechargeable battery is an example of _____ cells.
 5. The unit of inductance is _____.
- Q.2 (A) Answer any one question. [7]
1. Explain V-I characteristics of PN-junction diode.
 2. Explain Zener diode and Zener breakdown.
- Q.2 (B) Answer any one question. [4]
1. Explain conduction in intrinsic semiconductors.
 2. Write a note on N - type semiconductor.
- Q.2 (C) Answer any three questions. [3]
1. The cut-in or knee voltage of germanium semiconductor diode is about _____.
 2. A semiconductor has _____ temperature coefficient of resistance.
 3. The semiconductor has generally _____ valance electrons.
 4. The ideal diode behaves as perfect conductor in _____ bias condition.
 5. Gallium is a trivalent impurity element. Is it true?
- Q.3 (A) Answer any one question. [7]
1. Explain elastic collision in one dimension.
 2. Explain conservation of Linear momentum.
- Q.3 (B) Answer any one question. [4]
1. Explain Potential energy.
 2. Explain conservative force.
- Q.3 (C) Answer any three questions. [3]
1. The SI Unit of work is _____.
 2. Gravitational potential energy $V =$ _____.
 3. Write the type of the frame of reference.
 4. In an elastic collision, kinetic energy and _____ are conserved.
 5. If resultant force on the particle is zero, then the linear momentum is _____.
- Q.4 (A) Answer any one question. [7]
1. Explain parallel and perpendicular axis theorems of moment of inertia.
 2. State and prove Kepler's first and second law of planetary motion.

Q.4 (B) Answer any one question.

[4]

1. Explain torque of force about the axis of rotation.
2. Explain the state of weightlessness.

Q.4 (C) Answer any three questions.

[3]

1. The value of escape velocity on the surface of earth is _____.
2. The torque is maximum when the force is applied at the _____ to the position vector.
3. The SI unit of moment of inertia is _____.
4. As per the Kepler's first law of planetary motion angular motion of the planet about the sun remains _____.
5. The unit of angular acceleration is _____.

Q.5 (A) Answer any one question.

[7]

1. Explain young modulus, bulk modulus and modulus of rigidity.
2. Explain energy conservation simple harmonic motion.

Q.5 (B) Answer any one question.

[4]

1. Write a note Poisson's ratio.
2. Explain damped oscillations.

Q.5 (C) Answer any three questions.

[3]

1. Volume strain = _____.
2. The Poisson's ratio is dimension less quantity. Is it true?
3. The stress in a body is proportional to the corresponding _____.
4. The MKS unit shearing stress is _____.
5. The damping force is directed _____ to the velocity.
