647510 **0301101C1010** **Seat No :_____**

B.Sc. Semester - 1 (*CBCS*) Examination
Nov/Dec - 2022 (OLD COURSE)
PHYSICS (CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 (A) Answer any one question. **[7]**

1. Explain vector triple product.
2. Derive an expression of growth and decay of charge in RC circuit.

Q.1 (B) Answer any one question. **[4]**

1. Discuss maxima and minima as a differential calculus.
2. Explain primary cell and secondary cell.

Q.1 (C) Answer any three questions. **[3]**

1. The scalar quantities have only _____.
2. The acceleration is a _____ quantity.
3. A resistor is passive component. Is it true?
4. Dry cell is an example of _____ cell.
5. The unit of capacitance is _____.

Q.2 (A) Answer any one question. **[7]**

1. Explain PN-junction with forward bias and reverse bias.
2. Explain energy bands in crystal.

Q.2 (B) Answer any one question. **[4]**

1. Write a note on ideal diode.
2. Write a note on P-type semiconductor.

Q.2 (C) Answer any three questions. **[3]**

1. The energy band gap value for silicon semiconductor is _____.
2. In conductors valance band and conduction band is overlaps. Is it true?
3. The forward voltage drop across a germanium diode is about _____.
4. The pentavalent impurities are also known as _____ impurities.
5. The ideal diode behaves as perfect conductor in _____ bias.

Q.3 (A) Answer any one question. **[7]**

1. State and prove work energy theorem.
2. Explain kinetic energy and potential energy.

Q.3 (B) Answer any one question. **[4]**

1. Explain conservative force.
2. Explain conservation of energy.

Q.3 (C) Answer any three questions. **[3]**

1. The CGS unit of work is _____.
2. The work done by conservative force along a closed path is always _____.
3. Viscous force is an example of _____ force.
4. The energy possessed by a body due to its position is called _____ energy of the body.
5. The linear momentum is constant, if the resultant force on the particle is ____.

Q.4 (A) Answer any one question. **[7]**

1. Explain angular momentum of rigid body and conservation of angular momentum.
2. Explain gravitational field and gravitational potential.

Q.4 (B) Answer any one question. **[4]**

1. Explain moment of inertia.
2. Write a note on escape velocity

Q.4 (C) Answer any three questions. **[3]**

1. What is the unit of angular velocity?
2. The CGS unit of moment of inertia is _____.
3. The value of escape velocity on the surface of earth is_____.
4. Write an equation of Kepler's third law of planetary motion.
5. The net force on all bodies inside a satellite is _____.

Q.5 (A) Answer any one question. **[7]**

1. Explain stress and strain.
2. Explain energy conservation in simple harmonic motion.

Q.5 (B) Answer any one question. **[4]**

1. Write a note Poisson's ratio.
2. Explain forced oscillations and resonance.

Q.5 (C) Answer any three questions. **[3]**

1. Longitudinal strain = _____.
2. The practical value of Poisson's ratio is lies between _____ and _____.
3. The unit of frequency is _____.
4. Write an equation of damping force.
5. The ratio of tensile stress over tensile strain is called _____ modulus.

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