647510 **BSCphyCC1010** **Seat No :_____**

B.Sc. Semester - 1 (*CBCS*) Examination
Oct/Nov. -2019 (NEW COURSE)
PHYSICS (CORE)

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

Instructions:

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

Que-1 (A) Answer any two questions. **(10)**

1. Explain vector triple product.
2. Explain Michelson Morley Experiment.
3. Describe relativistic addition of velocities.

Que-1 (B) Answer any one question. **(04)**

1. Write a note on Scalar and Vector quantities.
2. Write a note on length contraction.

Que-2 (A) Answer any two questions. **(10)**

1. Explain energy bands in metals, semiconductors and insulators.
2. Explain the formation of PN-junction with forward bias.
3. Write a note on N-type semiconductor.

Que-2 (B) Answer any one question. **(04)**

1. Write a note on zener diode.
2. Write a note on ideal diode.

Que-3 (A) Answer any two questions. **(10)**

1. Explain work-energy theorem.
2. Derive the equation of moment of inertia for soild cylinder.
3. Explain Angular momentum of a rigid body and prove that $\tau = I\alpha$

Que-3 (B) Answer any one question. **(04)**

1. Explain Centre of mass of large number of particles system.
2. Write a note on moment of inertia.

Que-4 (A) Answer any two questions. **(10)**

1. What is gravitational potential? Derive an expression for the gravitational potential and gravitational field at a point outside the sphere.
2. What is escape velocity? Derive an expression for escape velocity.
3. State and prove Kepler's first law of planetary motion.

Que-4 (B) Answer any one question. **(04)**

1. Write a note on geosynchronous orbits.
2. Write a note on GPS.

Que-5 (A) Answer any two questions. **(10)**

1. Derive the formula for displacement of particle in simple harmonic motion.
2. Explain forced oscillations and define resonance.
3. Explain various types of stresses.

Que-5 (B) Answer any one question. **(04)**

1. Explain energy conservation in simple harmonic motion.
2. Explain Young modulus and Bulk Modulus.

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