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BSCphyCC1010

Seat No : _____

B.Sc. Semester - 1 (CBCS) Examination

Jan/Feb.-2022 (NEW 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 two questions out of three. (10)

1. Explain scalar product of two vectors.
2. Explain vector triple product.
3. Write a note on length contraction.

Q.1(B) Answer any one questions out of two. (04)

1. Discuss maxima and minima as a differential calculus.
2. Write a short note on time dilation.

Q.2(A) Answer any two questions out of three. (10)

1. Explain energy bands in solids: metals, semiconductors and insulators.
2. Write a note on formation of P-N junction.
3. Explain forward characteristic of a PN-junction diode.

Q.2(B) Answer any one questions out of two. (04)

1. Explain P-type semiconductor.
2. Explain zener diode characteristic.

Q.3(A) Answer any two questions out of three. (10)

1. Explain Newton's laws of motion.
2. Explain work energy theorem.
3. Derive the equation of moment of inertia of a solid cylinder about its axis.

Q.3(B) Answer any one questions out of two. (04)

1. Two particles of mass 1 kg and 3 kg have position vector $2\mathbf{i}+3\mathbf{j}$ and $-2\mathbf{i}+3\mathbf{j}-4\mathbf{k}$. find the centre of mass.
2. Derive relation between angular velocity and angular acceleration.

Q.4(A) Answer any two questions out of three. (10)

1. State the Kepler's first law of planetary motion and prove it.
2. Explain Escape velocity.
3. Write a note on GPS.

Q.4(B) Answer any one questions out of two. (04)

1. Derive an expression of gravitation potential and gravitational field due to solid sphere in case of a point outside the sphere.
2. Explain state of weightlessness.

Q.5(A) Answer any two questions out of three. (10)

1. Explain various types of strain.
2. Explain the determination of Young's modulus by Searl's method.
3. Obtain the equation of a SHM.

Q.5(B) Answer any one questions out of two. (04)

1. Explain various types of stresses.
2. Explain damped oscillations.
