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BSCphyCC1010
B.Sc. Semester - 1 (*CBCS*) Examination
Jan/Feb.-2022 (NEW COURSE)
PHYSICS(CORE)

Seat No :_____

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.**
 1. Explain scalar product of two vectors.   (10)
 2. Explain vector triple product.
 3. Write a note on lentgh contraction.

Q.1(B) **Answer any one questions out of two.**
 1. Discuss maxima and minima as a differential calculus.   (04)
 2. Write a short note on time dilation.

Q.2(A) **Answer any two questions out of three.**
 1. Explain energy bands in solids: metals, semicoductros and insulators.   (10)
 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.**
 1. Explain P-type semiconductor.   (04)
 2. Explain zener diode characteristic.

Q.3(A) **Answer any two questions out of three.**
 1. Explain Newton's laws of motion.   (10)
 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.**
 1. Two particles of mass 1 kg and 3 kg have position vector 2i+3j and -2i+3j-4k. find the centre of mass.   (04)
 2. Derive relation between angular velocity and angular acceleration.

Q.4(A) **Answer any two questions out of three.**
 1. State the Kepler's first law of planetary motion and prove it.   (10)
 2. Explain Escape velocity.
 3. Write a note on GPS.

Q.4(B) **Answer any one questions out of two.**
 1. Derive an expression of gravitation potential and gravitational field due to solid sphere in case of a point outside the sphere.   (04)
 2. Explain state of weightlessness.

Q.5(A) **Answer any two questions out of three.**
 1. Explain various types of strain.   (10)
 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.**
 1. Explain various types of stresses.   (04)
 2. Explain damped oscillations.

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