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

B.Sc. Semester - 1 (*CBCS*) Examination
Oct/Nov-2025 (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 the following question (any two). (10)

1) Explain scalar product of two vectors.
2) Expain vector triple product.
3) Write a note on time dilation.

Que.1(B) Answer the following question (any one). (04)

1) Discuss maxima and minima as a differential calculus.
2) Explain Einstein's postulates of the special theory of relativity.

Que.2(A) Answer the following question (any two). (10)

1) Explain energy bands in solids: metals, semicoductros and insulators.
2) Write a note on P-type semiconductor.
3) Explain forward characteristic of a PN- junction diode.

Que.2(B) Answer the following question (any one). (04)

1) Explain N-type semiconductor.
2) Explain zener diode characteristic.

Que.3(A) Answer the following question (any two). (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.

Que.3(B) Answer the following question (any one). (04)

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

Que.4(A) Answer the following question (any two). (10)

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

Que.4(B) Answer the following question (any one). (04)

1) State and prove Kepler's third law of planetary motion.
2) Explain state of weightlessness.

Que.5(A) Answer the following question (any two). (10)

1) Explain various types of strain.
2) Explain the determination of Young's modulus by Searl's method.
3) Write a note on damped oscillations.

Que.5(B) Answer the following question (any one). (04)

1) Explain relation between longitudinal stress and strain.
2) Explain simpe harmonic motion with the help of block-spring system.

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