

B.Sc.(FS) Semester - 1 (CBCS) Examination
July-2025 (OLD COURSE)
PHYSICS (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

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

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- Que-1(A) Answer the following question (any one). (07)**
- 1) Write a note on scalar product of two vectors.
 - 2) Derive an expression of growth and decay of charge in RC circuit.
- Que-1(B) Answer the following question (any one). (04)**
- 1) Explain addition of vectors.
 - 2) Explain concept of voltage source.
- Que-1(C) Answer the following question (any three). (03)**
- 1) When two vectors $\vec{A}$ and $\vec{B}$ are perpendicular to each other then $\vec{A} \cdot \vec{B} = \dots\dots$
 - 2) When two vectors $\vec{A}$ and $\vec{B}$ are parallel to each other then $\vec{A} \times \vec{B} = \dots\dots$
 - 3) What is the value of a resistor having bands red, orange, red and gold?
 - 4) The unit of inductance is
 - 5) Draw the symbol of LED.
- Que-2(A) Answer the following question (any one). (07)**
- 1) Write a note on energy bands in metal, insulators and semiconductor.
 - 2) Explain zener diode with characteristic.
- Que-2(B) Answer the following question (any one). (04)**
- 1) Write a note on extrinsic P-type semiconductor.
 - 2) Explain forward characteristic of P-N junction diode.
- Que-2(C) Answer the following question (any three). (03)**
- 1) All semiconductor elements belong to the group of of the periodic table.
 - 2) For germanium $E_g = \dots\dots\dots$ eV.
 - 3) The electrical conductivity of a semiconductor is if temperature is increased.
 - 4) In N-type semiconductor, are majority charge carriers.
 - 5) The diode conducts well in bias.
- Que-3(A) Answer the following question (any one). (07)**
- 1) Define work and energy and explain work energy theorem.
 - 2) Explain elastic collision in one dimension.
- Que-3(B) Answer the following question (any one). (04)**
- 1) Explain Newton's laws of motions.
 - 2) Write a short note on conservative force.
- Que-3(C) Answer the following question (any three). (03)**
- 1) Newton's first law of motion is also known as law of
 - 2) Newton's second law of motion gives an idea to measure
 - 3) Work is a quantity.
 - 4) The SI unit of the power is
 - 5) A collision in which k.e. is not conserved is known as collision.

- Que-4(A) Answer the following question (any one). (07)**
- 1) State and prove two theorems of moment of inertia.
 - 2) Explain escape velocity.
- Que-4(B) Answer the following question (any one). (04)**
- 1) Explain angular momentum of a particle.
 - 2) Give the statements of Kepler's laws of planetary motion.
- Que-4(C) Answer the following question (any three). (03)**
- 1) Relation between linear velocity v and angular velocity ω is, $v = \dots\dots\dots$
 - 2) The SI unit of torque is $\dots\dots\dots$
 - 3) The dimensional formula of moment of inertia is $\dots\dots\dots$
 - 4) The mks unit of gravitational constant G is $\dots\dots\dots$
 - 5) The escape velocity on the surface of the earth is $\dots\dots\dots$ km/s.
- Que-5(A) Answer the following question (any one). (07)**
- 1) Explain various types of strains.
 - 2) Explain the determination of Young's modulus by Searl's method.
- Que-5(B) Answer the following question (any one). (04)**
- 1) Explain longitudinal and shearing stress.
 - 2) Explain types of modulus of elasticity in short.
- Que-5(C) Answer the following question (any three). (03)**
- 1) The cgs unit of stress is $\dots\dots\dots$
 - 2) The mks unit of strain is $\dots\dots\dots$
 - 3) Dimension of Poisson's ratio is $\dots\dots\dots$
 - 4) According to Hook's law $\frac{\text{stress}}{\text{strain}} = \dots\dots\dots$
 - 5) Young modulus is property of $\dots\dots\dots$
