

B.Sc. 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.

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 $\dots\dots\dots$
