

B.Sc. Semester - 1 (CBCS) Examination
Oct/Nov. -2019 (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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1(a) Answer the following question (any one). (7)

- (1) Write a note on scalar product of two vectors.
- (2) Derive an expression of growth and decay of charge in RC circuit.

1(b) Answer the following question (any one). (4)

- (1) Explain resolution of vectors.
- (2) Explain concept of voltage source.

1(c) Answer the following question (any three). (3)

- (1) When two vectors $\vec{A}$ and $\vec{B}$ are perpendicular to each other then $\vec{A} \cdot \vec{B}$
- (2) When two vectors $\vec{A}$ and $\vec{B}$ are parallel to each other then $\vec{A} \times \vec{B}$
- (3) What is the value of a resistor having bands red, orange, red and gold?
- (4) The unit of capacitance is
- (5) Draw the symbol of LED.

2(a) Answer the following question (any one). (7)

- (1) Write a note on energy bands in metal, insulators and semiconductor.
- (2) Explain zener diode with characteristic.

2(b) Answer the following question (any one). (4)

- (1) Write a note on extrinsic N-type semiconductor.
- (2) Explain forward characteristic of P-N junction diode.

2(c) Answer the following question (any three). (3)

- (1) Write two names of semiconductor elements.
- (2) For germanium $E_g = \dots\dots\dots \text{eV}$.
- (3) The electrical resistivity of a semiconductor is if temperature is increased.
- (4) In P-type semiconductor, are majority charge carriers.
- (5) The critical temperature for silicon is $^{\circ}\text{C}$.

3(a) Answer the following question (any one). (7)

- (1) Define work and energy and explain work energy theorem.
- (2) Explain elastic collision in one dimension.

3(b) Answer the following question (any one). (4)

- (1) Explain Newton's laws of motions.
- (2) Write a short note on conservative force.

3(c) Answer the following question (any three). (3)

- (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.

4(a) Answer the following question (any one). (7)

- (1) State and prove two theorems of moment of inertia.
- (2) Explain escape velocity.

4(b) Answer the following question (any one). (4)

- (1) Explain angular momentum of a particle.
- (2) Give the statements of Kepler's laws of planetary motion.

4(c) Answer the following question (any three). (3)

- (1) Relation between linear velocity v and angular velocity ω is, $v = \dots\dots\dots$
- (2) The SI unit of torque is
- (3) The dimensional formula of moment of inertia is
- (4) The mks unit of gravitational constant G is
- (5) The escape velocity on the surface of the earth iskm/s.

5(a) Answer the following question (any one). (7)

- (1) Explain various types of strains.
- (2) Explain the determination of Young's modulus by Searl's method.

5(b) Answer the following question (any one). (4)

- (1) Explain longitudinal and shearing stress.
- (2) Explain types of modulus of elasticity in short.

5(c) Answer the following question (any three). (3)

- (1) The cgs unit of stress is
- (2) The mks unit of strain is
- (3) Dimension of Poisson's ratio is
- (4) According to Hook's law $\frac{\text{stress}}{\text{strain}} = \dots\dots\dots$
- (5) Young modulus is property of
