

B.Sc. Semester - 1 (CBCS) Examination
Feb/Mar. -2021 (OLD COURSE)
PHYSICS(CORE)

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 one question. (07)

1. Explain integral calculus
2. Explain ideal and practical voltage source.

Q.1(B) Answer any one question. (04)

1. Write a note on resistors.
2. Explain the resolution of vectors.

Q.1(C) Answer any three questions. (03)

1. Force is a scalar quantity. Is it true?
2. If the two vectors are collinear, then $A \times B = \underline{\hspace{2cm}}$
3. Write the name of passive components.
4. A Primary cells converted $\underline{\hspace{2cm}}$ energy into electrical energy.
5. An ideal voltage source must have $\underline{\hspace{2cm}}$ internal impedance.

Q.2(A) Answer any one question. (07)

1. Explain the formation of PN-junction with forward bias and reverse bias.
2. Explain energy bands in crystal.

Q.2(B) Answer any one question. (04)

1. Write a note on ideal diode.
2. Write a note on P-type semiconductor.

Q.2(C) Answer any three questions. (03)

1. A pentavalent impurity is also known as $\underline{\hspace{2cm}}$ impurity.
2. A semiconductor has positive temperature coefficient of resistance. Is it true?
3. The ideal diode behaves as perfect conductor in $\underline{\hspace{2cm}}$ bias condition.
4. The forward voltage drop across a silicon diode is about $\underline{\hspace{2cm}}$.
5. A zener diode is normally operated under $\underline{\hspace{2cm}}$ bias condition.

Q.3(A) Answer any one question. (07)

1. Explain centre of mass of (i) two particles and (ii) large numbers of particles.
2. Explain conservation of Linear momentum.

Q.3(B) Answer any one question. (04)

1. State and prove work energy theorem.
2. Explain conservation of Energy.

Q.3(C) Answer any three questions. (03)

1. Write the type of the frame of reference.
2. As per work – energy theorem the work done by a force is equal to _____.
3. Write the type of collision.
4. If the resultant force acting on the particle is zero, then the momentum of the system is _____.
5. The SI Unit of power is _____.

Q.4(A) Answer any one question. (07)

1. Explain moment of inertia of rectangular bar.
2. What is gravitational potential? Derive an expression for the gravitational potential and gravitational field at a point outside the sphere.

Q.4(B) Answer any one question. (04)

1. State and prove Kepler's second of planetary motion.
2. Write a note on escape velocity

Q.4(C) Answer any three questions. (03)

1. What is the unit of angular acceleration?
2. The torque $\tau =$ _____.
3. What is the SI unit of moment of inertia?
4. The value of escape velocity on the surface of earth is 11.2 m/s. is it true?
5. Write an equation of gravitational potential energy.

Q.5(A) Answer any one question. (07)

1. Explain three types of modulus of elasticity.
2. Explain simple harmonic motion and derive equation of displacement for simple harmonic motion.

Q.5(B) Answer any one question. (04)

1. Write a note Poisson's ratio.
2. Explain forced oscillation and resonance.

Q.5(C) Answer any three questions. (03)

1. Volume strain = _____.
2. As per Hook's law the stress is proportional to the _____.
3. Write the MKS unit of young modulus.
4. In SHM equation ω is angular frequency. Is it true?
5. Write an equation of damping force.
