

B.Sc. Semester - 1 (CBCS) Examination
Nov./Dec. -2018 (New 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 any one question. (07)
1. Explain scalar and vectors. Write a note on vector triple product.
 2. Explain constancy of speed of light.
- (B) Answer any one question. (04)
1. Explain differential calculus as maxima and minima.
 2. Write a note on time dilation.
- (C) Answer any three questions. (03)
1. The dot product of two mutually perpendicular vectors is _____.
 2. A Volume is a _____ quantity.
- Que-2 (A) Answer any one question. (07)
1. Explain the formation of PN-junction with forward bias and reverse bias.
 2. Explain zener diode, its breakdown mechanism and V-I characteristics of it.
- (B) Answer any one question. (04)
- (1) Write a note on P-type semiconductor.
 - (2) Write a note on N-type semiconductor.
- (C) Answer any three questions. (03)
- (1) The forward voltage drop across a Silicon diode is about _____.
 - (2) The pentavalent impurities are also known as _____ impurities.
 - (3) The semiconductor has generally _____ valance electrons.
 - (4) The ideal diode behaves as a perfect conductor in which bias condition.
 - (5) A zener diode is normally operated under _____ bias.
- Que-3 (A) Answer any one question. (07)
- (1) Explain kinetic energy and work-energy theorem.
 - (2) Explain moment of inertia of a rectangular bar.
- (B) Answer any one question. (04)
- (1) Explain linear momentum and its conservation principle.
 - (2) Write a note on moment of inertia.
- (C) Answer any three questions. (03)
- (1) Which frame of reference obeyed the newton's first law?
 - (2) The work done by the conservative force along a closed path is always _____.
 - (3) Write the unit of angular momentum.
 - (4) Write the dimensional formula of torque.
 - (5) Write the equation of angular momentum.
- Que-4 (A) Answer any one question. (07)
- (1) Explain gravitational field, gravitational potential and derive relational between gravitational potential and field strength.
 - (2) Explain the motion of planets and satellite in circular orbit.
- (B) Answer any one question. (04)
- (1) Write a note on Escape velocity.
 - (2) Write a note on Geosynchronous orbits.

- (C) Answer any three questions. (03)
- (1) Write the equation of newton's law of gravitation.
 - (2) What is the SI unit of intensity of gravitational field?
 - (3) What is the value of escape velocity on the surface of the earth?
 - (4) Write the full form of GPS.
 - (5) How many satellites required to cover the entire earth in geosynchronous orbits?
- Que-5 (A) Answer any one question. (07)
- (1) Define Young's modulus and explain the method of determining Young's modulus by Searle's method.
 - (2) Drive equation of motion for simple harmonic motion.
- (B) Answer any one question. (04)
- (1) Write a note on Poisson's ratio.
 - (2) Explain energy conservation in simple harmonic motion.
- (C) Answer any three questions. (03)
- (1) Which energy remains constant with time in SHM?
 - (2) The practical value of Poisson's ratio is lies between _____ and _____.
 - (3) Amplitude of damped oscillations decreases _____ with time.
 - (4) Resonance occurs when applied frequency is equal to _____ frequency.
 - (5) Define the Hook's law.
