

B.Sc. Semester - 1 (CBCS) Examination

Feb/Mar. -2021 (NEW 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.

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- Q.1(A) Answer the following question. (any two) (10)
1. Discuss scalar product of two vectors.
 2. Explain vector triple product.
 3. Write a note on time dilation.
- Q.1(B) Answer the following question. (any one) (04)
1. Discuss maxima and minima as a differential calculus.
 2. Explain Einstein's postulates of the special theory of relativity.
- Q.2(A) Answer the following question. (any two) (10)
1. Write a note on energy bands in solids.
 2. Explain N-type semiconductor.
 3. Write a note on zener diode.
- Q.2(B) Answer the following question. (any one) (04)
1. Write a note on formation of PN-junction.
 2. Explain forward characteristics of a PN-junction diode.
- Q.3(A) Answer the following question. (any two) (10)
1. Explain work energy theorem.
 2. Explain potential energy and conservation of energy.
 3. Derive an equation of M.I. of a uniform solid cylinder about its axis.
- Q.3(B) Answer the following question. (any one) (04)
1. Explain linear momentum and its conservation principle.
 2. Derive the relation between torque and angular acceleration. ($\vec{\tau} = I\vec{\alpha}$).
- Q.4(A) Answer the following question. (any two) (10)
1. Derive an expression for the gravitational potential and field when a point inside the sphere.
 2. Explain escape velocity.
 3. Write a note on geosynchronous orbits.
- Q.4(B) Answer the following question. (any one) (04)
1. State and prove Kepler's third law of planetary motion.
 2. Write a note on GPS.
- Q.5(A) Answer the following question. (any two) (10)
1. Explain various types of stress.
 2. Explain the Searl's method for determining Young's modulus of a long wire.
 3. Write a note on damped oscillations.
- Q.5(B) Answer the following question. (any one) (04)
1. Discuss relation between longitudinal stress and strain.
 2. Explain simple harmonic motion with the help of block-spring system.
