

Question Bank for B.Sc MPCs Ist Semester

Mechanics

UNIT I

Short Answer Type Questions:

1. Define Scalar and Vector fields.
2. What is the Gradient of a scalar field? Write its physical significance.
3. What is the Divergence of a vector? And write its physical significance.
4. Define Curl and explain how it is related with line integral?
5. Write any three examples of vector product.
6. State Stoke's theorem.
7. State Gauss's theorem.
8. State Green's theorem.

Long Answer Type Questions:

1. Define Gradient and derive the expression for the same with its physical significance.
2. Define Divergence and derive the expression for the same with its physical significance.
3. Define Curl and derive the expression for the same with its physical significance.
4. State and Prove Stoke's theorem.
5. State and Prove Gauss's theorem.
6. State and Prove Green's theorem.

UNIT II

Short Answer Type Questions:

1. State laws of motion.
2. What is motion of variable mass system and write the example for this.
3. Write the expressions for energy and momentum.
4. What are elastic and inelastic collisions?
5. How semi-elastic collision is different from inelastic collision?
6. What is the concept of impact parameter?
7. Define scattering cross section and write the expression.
8. Define rigid body.
9. State rotational kinematic relations.

10. Write the expression for equation of motion of a rotating body.
11. Write momentum and inertial tensors.
12. Write Euler's equations.

Long Answer Type Questions:

1. Derive the equation for the motion of a variable mass system.
2. Find the final velocity of a rocket by discussing the motion of a rocket.
3. Write a short note on conservation of energy and momentum.
4. Discuss the collisions in two dimensions.
5. What is three dimensional collision and derive the expression for elastic collision.
6. Derive the formula for scattering cross section.
7. Define rigid body and derive the rotational kinematic relations.
8. Derive the equation of motion of a rotating body.
9. Derive Euler's equations.
10. Discuss the motion of precession of a top.
11. Explain briefly about Gyroscope.

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