

Questions for the theoretical colloquium

1. Physical reality and modeling (material point model, coordinate system, reference frame, the equations of motion).
 2. Kinematic characteristics (displacement vector, path, velocity vector, magnitude of velocity, acceleration vector).
 3. Velocity for a general type motion (including the angular velocity vector, velocity of rotational motion).
 4. The acceleration for a general type motion (including the tangential acceleration, normal acceleration, the radius of curvature of a trajectory).
 5. Integration of the equations of motion (for a given speed).
 6. Integration of the equations of motion (for a given acceleration).
 7. Newton laws. Types of forces in the dynamics of a material point.
 8. System of interacting material points (center of mass, radius vector of a center of mass, velocity and impulse of a center of mass).
 9. Theorem of a center of mass motion.
 10. Impulse conservation law.
 11. Absolutely rigid body model. Definition of the rotational and linear motions.
 12. Rotational motion: impulse momentum and force momentum.
 13. Rotational motions: projection of impulse and force momentums on the axis of rotation.
 14. The basic law of rotational motion. Conservation law of impulse momentum.
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