

a successful participant should master (1st year of undergraduate level - Halliday & Resnick):

- Adding and multiplying vectors (dot and cross)
- Differentiation and integration of simple functions
- Linear and circular motion in Two and Three Dimensions
- Newton's laws
- Kinetic energy and work
- Potential energy and conservation of energy
- Center of mass
- Linear momentum
- Torque and angular momentum
- Harmonic oscillations
- Damped simple harmonic motion
- Forced oscillations and resonance

you are also expected to be familiar with (high school level):

- Motion in the gravitational field
- Drag Force and Terminal Speed
- Friction
- Transverse and longitudinal waves
- Wavelength and frequency
- Interference
- Electric and magnetic fields
- Electromagnetic waves
- Diffraction
- Optics
- Fluids, density and pressure
- Archimedes' principle
- Sound waves

notes:

- More advanced related topics should be taught by the leaders for each question separately.
- Students will not be asked to solve mathematically complicated problems in the exam. They should have learned the concepts!