THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1.   Answer the following short questions: (15x2=30)

i.   What is the difference between elastic and inelastic collisions?

ii.   Define pseudo forces. Give any two examples.

iii.   Steel is more elastic than rubber. Explain what does it mean?

iv.   What is the difference between conservative and non-conservative forces?

v.   What do you mean by angular momentum?

vi.   What is Huygen's principle?

vii.   State work energy theorem.

viii. Define viscosity.

ix.   What are the elastic properties of matter?

x.   What is meant by laminar flow?

xi.   What is Fresnel diffraction?

xii.   Does the center of mass of a solid object necessarily lie within the object? If not, give example.

xiii. A body of mass 4.5g is dropped from rest at a height of 10.5m above surface of earth. What will be its speed just before it strikes the ground?

xiv.   What is holography?

xv.   What do you understand by gravitational potential energy?

Answer the following questions.

Q.2.   (a) Explain and prove work-energy theorem. **(6 Marks)**

   (b) A block of mass m=3.63kg slides on a horizontal frictionless table with a speed of v=1.22 m/s. It is brought to rest in compressing a spring in its path. By how much is the spring compressed if its force constant k=135 N/m? **(4 Marks)**

Q.3.   (a) State parallel axis theorem. Find the rotational inertia of solid sphere about its diameter? **(5 Marks)**

   (b) Apply Bernoulli's equation to relate the total energy density at one point on a streamline to the value at another point. **(5 Marks)**

Q.4.   (a) When a beam is sent into a polarizing sheet, explain the function of the sheet in terms of its polarizing direction (or axis) and the electric field component that is absorbed and the component that is transmitted. **(6 Marks)**

   (b) A thin film with n=1.42 for light of wavelength 589 nm is placed in one arm of a Michelson interferometer. If this causes a shift of 7.0 bright fringes, what is the film thickness? **(4 Marks)**