COMBINED COMPETITIVE EXAMINATION (MAIN)

PHYSICS

Paper—I

Time : 3 hours *Full Marks* : 200

Note : *(1) The figures in the right-hand margin indicate full marks for the questions.*

*(2) Attempt **five** questions in all.*

*(3) Question No. **1** is compulsory.*

1. Answer any *ten* of the following : 4×10=40

(a) Show that angular momentum for a body moving under central force is conserved.

(b) State Keplar's laws for planetary motion.

(c) Write the assumptions made by van der Waals to obtain an equation of state.

(d) What is central force? Deduce Keplar's second law.

(e) What are group velocity and phase velocity of waves?

(f) Find the ratio $\gamma(C_p / C_v)$ for a diatomic molecule.

(g) Why is Kelvin scale called absolute scale?

(h) Show that the torque acting on a body moving under central force is zero.

(i) Proton and helium nuclei are moving with same momentum. Find the ratio between their kinetic energies.

(j) Obtain the dimensions of universal gravitational constant.

(k) What are geostationary satellites?

(l) Define solar constant.