SUBJECTIVE TEST

SECTION: A (1 × 5 = 5) **Time: $1\frac{1}{2}$ hr.** **M.M. 35**

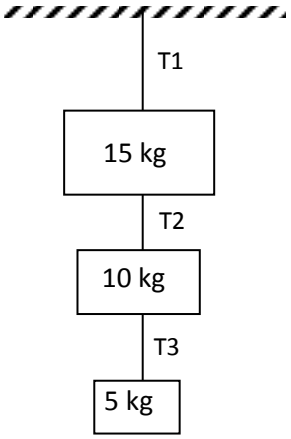
1. What does area under velocity – time graph represent?
2. A ball is thrown straight up. What is its velocity and acceleration at the top?
3. What is net force on a cork floating on the surface of water?
4. Can x-t graph be a straight line parallel to position – axis?
5. Action and reaction forces do not balance each other. Why?

SECTION: B (2 × 5 = 10)

6. Equation of state of some gas is given by: $\left(P + \frac{a}{V^2}\right)(V - b)$ = RT, where P is pressure, V is volume, T is absolute temperature, R is gas constant and a and b are also constants. Then what will be the dimensional formulae of 'a' and 'b'?
7. With the help of a suitable diagram show that angle of friction is equal to the coefficient of friction μ.
8. A shell is fired horizontally with velocity of 100 m/s form the top of a building of height 80 m. Find its time of flight and range?
9. State and prove work energy theorem.
10. Explain the fact that friction is a self-adjusting force.

SECTION: C (3 × 4 = 12)

11. It is easier to pull than to push a body. Explain.
12. State and explain the parallelogram method of vector addition.
13. A body moving with constant acceleration covers 25 m in 3rd second and 40 m. 6th second. Find the displacement from 0 to 10 sec.
14. Show that S_nth = u + $\frac{1}{2}$ $a\ (2n - 1)$ by calculus method.
15. In the following figure the entire system is at rest. Calculate the tension in each string. Take $g = 10ms^{-2}$.



SECTION: D (5 × 2 = 10)

16. Prove that when two bodies of equal masses undergo elastic collision in one dimension, their velocities are just interchanged.
17. Show that 2nd law is the Real Law of Motion.