

JIYA LAL MITTAL DAV PUBLIC SCHOOL

GRADE – XI SA-I (SEPT, 2015)

SUBJECT – PHYSICS

TIME: 3hrs.

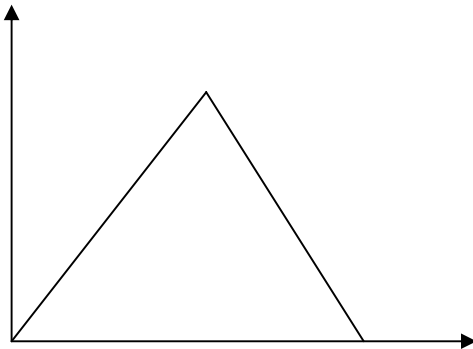
M.M-70

General Instructions:

1. All questions are compulsory.
2. There are 26 questions in total.
3. Questions 1 to 5 are very short answer questions and carry 1 mark each.
4. Questions 6 to 10 carry 2 marks each.
5. Questions 11 to 22 carry 3 marks each.
6. Questions 23 is value based question and carry 4 marks.
7. Questions 24 to 26 carry 5 marks each.
8. Use of calculator is not permitted. However, you may use log tables if necessary.

- 1) Give the dimensional formula of work.
- 2) Expand RADAR
- 3) If a light body and a heavy body have same momentum, then which one have greater K.E
- 4) What are orthogonal unit vectors?
- 5) An object having mass 2kg placed on a frictionless table. How much force is required to move it by a distance of 5m?
- 6) A man is moving on a horizontal surface and cover distance 'd' with a suitcase on his head. If the mass of suitcase is 'm'. Find the work done by man.
- 7) An object is moving with a uniform speed 5m/s from A to B. What is the force acting on the body?
- 8) Friction is a necessary evil. Explain.
- 9) Define angle of friction and angle of repose.
- 10) An object is thrown from a height 10m having mass 2kg. find its speed after 2s.

- 11) If $x = c + at^3 + bt^4$, where x is displacement as the function of time, give the dimension of a , b and c .
- 12) An object of mass 10kg moving with some initial velocity 5m/s a force is applied on it and its velocity became 10m/s. Find the work done to increase this speed.
- 13) Newton's 2nd Law is called real law of motion. Explain.
- 14) Three bodies are connected to each other with a string. The masses are m , $3m$ and $5m$ respectively. These bodies are being pulled with horizontal force F on a frictionless horizontal surface. The tension T_1 in first string is 16N. Find T_2
- 15) Discuss the Mass and pulley problem and find acceleration.
- 16) Show that when a body thrown vertically upward with some velocity, then its mechanical energy remains conserved.
- 17) State and prove impulse momentum theorem.
- 18) Find the expression for distance covered by body in n^{th} second.
- 19) The displacement time graph for a motion is given. Draw the velocity time graph for the same.



- 20) Two forces acting in opposite direction have a resultant of 10N. If they act at right angle to each, their resultant became 50N. Find magnitude of each force.

- 21) The K. E of an object is increased by 400%. What is percentage increase in its momentum?
- 22) Prove work – Energy Theorem.
- 23) An old woman crossing the road was holding a money purse. She was not able to walk. A pick pocket snatches away her purse. A school student of class X having seen this incident tries to help that old lady. He informs the police inspector who stands nearby. The Inspector collects the money purse from the pickpocket and hand it over to the old lady.
- (a) What values do you find in the school student?
- (b) Also the police inspector in a jeep is chasing the pickpocket on a straight road. The jeep is going at its maximum speed ' v '. The pickpocket rides on the motorcycle of a waiting friend when the jeep is at a distance ' d ' away and the motorcycle starts with a constant acceleration ' a '. Show that the pickpocket will be caught if
- 24) Find all the three equations of motion by graphical method.
Or
Find all the three equations of motion by calculus method.
- 25) Show that the path followed by projectile is parabolic, when it is fired at angle Q with horizontal and also find:
- (a) Maximum height
(b) Time of flight
(c) Horizontal range
- Or
- Show that the path followed by projectile is parabolic when fired at angle Q with vertical and also find:
- (a) Maximum height
(b) Time of flight
(c) Horizontal range
- 26) Show that the velocities of particles exchange after the collision when the collision is elastic in one dimension.
Or
A motor boat covers a distance between two spots on the river in time of 8 hours and 12 hours down stream and up stream, then what is the time required for the boat to cover this distance in still water?

