

Ramjas School RKPuram

4/100

Ist Term Exam 2015-16

Class: XI

Subject: Physics

MM: 70 Time: 3hrs

INSTRUCTIONS:

- (i) All questions are compulsory.
- (ii) Question numbers 1 to 5 are very short answer type questions, carrying one mark each.
- (iii) Question numbers 6 to 10 are short answer type questions, carrying two marks each.
- (iv) Question numbers 11 to 22 are also short answer type questions, carrying three marks each.
- (v) Question No 23 is value based question carrying four marks.
- (vi) Question numbers 24 to 6 are long answer type questions, carrying five marks each.
- (viii) Use of calculators is not permitted. However, you may use log tables, if necessary

1 Mark Questions

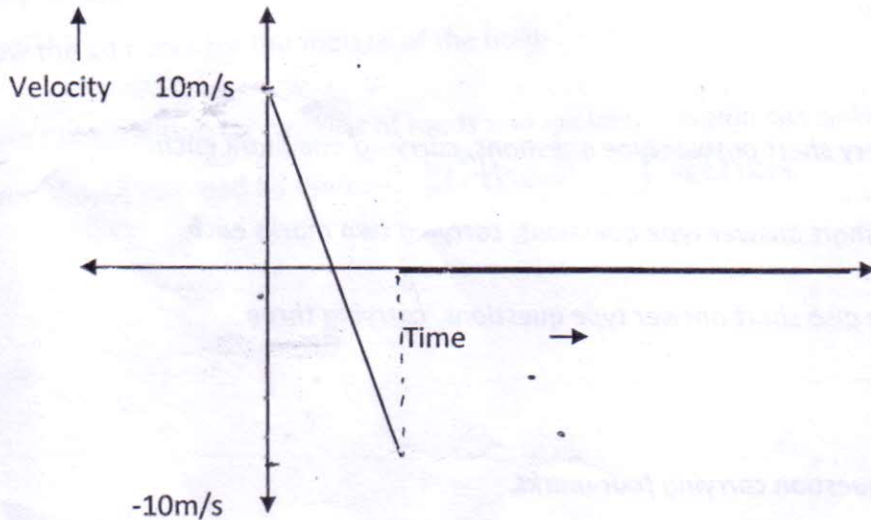
- Q1. Name any two physical quantities having the same dimensions.
- Q2. Which of the following measurements is more accurate and why?
(i) 0.0002g (ii) 20.0g
- Q3. A body covers 200mts in first 20s of its motion. If its initial velocity is 2m/s, find the acceleration of the body.
- Q4. Name the weakest and the strongest force in nature.
- Q5. If Force $F=3i + j + 5k$ and displacement $S=5k$. Find the work done.

2 Mark Questions

Q6. Convert 3000 km into light years.

Q7. What can you say about the nature of the acceleration associated with a mass whose v-t graph is shown.

Give a real life example to explain the same.



Q8. Derive the equation $s = ut + \frac{1}{2}at^2$ graphically.

Q9. Why is it easier to keep a vehicle moving than to start it? Explain it using relevant graph.

Q10. Calculate the Power of a motor which is capable of raising 2000 litre of water in 5 minutes from a well 120m deep.

3 Mark Questions

Q11. Deduce the expression for energy of a body executing SHM by the method of dimensions, assuming that the energy of the body depends upon (a) the mass, (b) the frequency and (c) the amplitude of vibration. Take the constant of proportionality $2\pi^2$.

Q12. Explain instrumental errors and random errors using an example each.

Q13. A ball is thrown up with a velocity of 60 m/s and at the same time, another ball is dropped from a building 200m high. When and where will the two balls meet?

Q14. A ball is dropped from a height. Draw the speed-time, velocity- graph of its motion if it loses some of its

speed every time it strikes the ground

Q15. A ball is dropped from a balloon ascending with a speed of 10m/s. How much time will the ball take to reach the ground if the height of the balloon is 500m?

Q16. Earth moves in a circular orbit around the Sun once every year with an orbital radius of 1.5×10^{11} m. What is the acceleration of the earth while moving in a circular orbit?

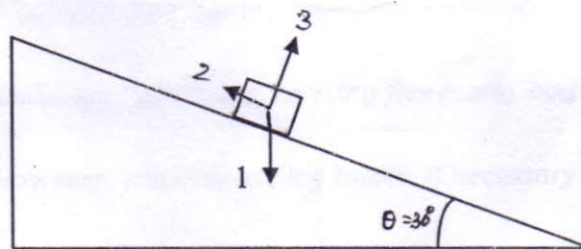
Q17. A ^{long} high jumper makes a near record jump of 8.5 m the jumper leaves the ground at an angle of 20° to the horizontal. Assuming jumper to be a point mass, find (a) the speed at which the jumper leaves the ground, (b) the maximum height reached by him.

Q18. Show that path of a projectile fired horizontally is parabolic in nature.

Q19. A block of wood of mass 3Kg is resting on the surface of a rough inclined surface, inclined at an angle of 30° as shown in the Fig.

(a) Name the forces 1, 2, 3

(b) If the coeff of Friction is 0.2, calculate the value of all the three forces .



Q20. Friction is a necessary evil. Elaborate.

Q21. Distinguish between Conservative and Non-Conservative Forces. Also give an example to substantiate your answer.

Q22. A projectile is fired from the top of a 400m high cliff with an initial speed of 25m/s at an unknown angle. Find its speed when it hits the ground.

4 Mark Question

Q23. Sunita went to the market to purchase cloth and observed that the shopkeeper had a broken meter scale. The first two divisions (ie 2cm) of the meter scale were missing; she immediately pointed it out, and asked him to measure properly. What are the values exhibited by Sunita? What is this type of error called? What percentage error would such a scale(broken) make?

5 Mark Question

Q24. Discuss the collision of two bodies in a straight line. Obtain the expression for the final velocities.

Hence prove that when bodies of equal masses collide they interchange their velocities *elastic*

Q25. A body covers 100 mts in 10th sec and 200 mts in 20th sec. How much distance will the body cover in 18 sec? Draw the s-t curve for the motion of the body

Q26. Obtain the condition for banking of roads and explain, if friction can provide necessary centripetal force, why should the road be banked? *without friction.*

