MES INDIAN SCHOOL DOHA- QATAR

HOLIDAY ASSIGNMENT -2016 – 2017

BOYS

PHYSICS

CLASS XI(CBSE)

1. *The frequency n of a stretched string may depend on*
    1. *Length of the vibration segment l.*
    2. *The tension in the string F*
    3. *The mass per unit length m.*

    Show that n α (1/l)√(F/M).
2. *What is meant by the dimensions of a physical quantity? What are the uses of dimensional equations? Check the correctness of the equation P=hdg*
3. *In the determination of 'g' by a simple pendulum, 100 oscillations are taken and total time measured is 200s. The count of the stop watch is 0.1S. The Length of the pendulum measured with a metric scale of least count 1mm is 1m. Find the percentage error in the value of g?*
4. *Write the advantages and disadvantages of dimensional analysis?*
5. *What are significant figures? The length, breadth & thickness of rectangular sheet are 4.23m, 1.005m & 2.01cm respectively. Give the area and volume of the sheet to correct significant figures?*
6. *Define uniform velocity and uniform acceleration? , derive relation*
    1. $S = ut + ½\ at^2$
    2. $V^2 - U^2 = 2as$
7. *What is meant by velocity time graph. Draw the velocity time graph of a body thrown vertically upward. Mark on the graph(a) maximum height(b) time of ascent and time of flight*
8. *If n is the velocity of the car, a is the maximum retardation possible, find the minimum distance in which it can be stopped.*
9. *Show the area under velocity time graph represents the distance travelled.*
10. *Draw the displacement – time graph of a freely falling body?*
11. *Can the speed of a particle ever be negative? If so, give an example. If not explain why?*
12. *Can bodies with different velocities have the same acceleration? Explain*
13. *A stone is thrown vertically upward with a velocity 14.7m/S. Calculate*
    1. *The greatest height.*
    2. *Time taken to reach the highest point.*
    3. *Time of flight .*
    4. *Velocity with which it strikes the ground.*
14. *A particle travels half a distance at 12km/h and the remaining half at 18km/h. Calculate the average speed.*
15. *Prove that the path of a projectile is a parabola.*
16. *Define a uniform circular motion. For uniform circular motion, prove that linear velocity*

$V = r\omega$

17. State the law of parallelogram of vectors. Find the magnitude and direction of the resultant of two vectors A and B.
18. What is meant by centripetal acceleration? Derive the formula for centripetal acceleration.
19. Prove that, for a given velocity of projection, the horizontal range is same for θ and $(90 - \theta)$
20. Prove that the Vectors $(i + 2j + 3k)$ and $(2i + j)$ are perpendicular to each other.
21. Rain is falling Vertically with a speed for 30m/S. A woman rides a bicycle with a speed of 10m/s in the north to south direction. What is the direction in which she should hold her umbrella?

22. A stone tied to the end of a string 80cm long is whirled in a horizontal with a constant speed. If the stone makes 14 revolutions in 25s, what is the magnitude and direction of acceleration of the stone?
23. Write the three laws of motion
24. Establish the fact that the first and third laws of newton are in second law?
25. State law of conservation of momentum and prove it using
    1. Second law of motion
    2. Third law of motion
26. Distinguish between static friction, limiting friction and kinetic friction. How do they vary with the applied force?
27. Prove that the coefficient of static friction is tangent of the angle of repose.
28. Derive a relation for the safe velocity of negotiating a curve by a body in a banked curve with frictional coefficient μ.
29. Define
    1. Angle of friction.
    2. Angle of repose.
30. Why does a gun recoil? Derive the recoil velocity of a gun?
31. Define impulse. A cricket ball of mass 150gm moving with speed of 12m/s is hit by a bat so that the ball is turned back with a velocity of 20m/s. Calculate the impulse received by the ball.
32. A bullet of mass 0.01kg moving at a speed 100m/s strikes a wooden plank of thickness 0.1m and emerges with a velocity 25m/s. Find the resistance offered by the plank assuming it to be uniform.
33. A bullet of mass 0.06kg moving with a speed of 500m/s is brought to rest in 0.01s. Find the impulse and the average force of the blow.
34. A shot of weighing 1kg is fixed from a gun weighing 5 ton with a velocity 1000 m/s. Find the velocity of recoil. Also calculate the force required to stop the gun in a distance of 0.25m.
35. Explain the term 'work' and 'power'. How will you evaluate the work done by a variable force?
36. What is work-energy theorem?
37. Distinguish between elastic and inelastic collisions.

38. *Derive an expression for the kinetic energy of a moving body.*
39. *Discuss elastic collision in one dimension. Obtain expression for the velocities of two bodies after such a collision.*
40. *State and explain the law of conservation of energy. Illustrate the law in the case of*
    1. *A freely falling body*
    2. *An oscillating pendulum*
41. *An engine pumps 2000kgs of water in one minute to an average height of 10m. calculate the power of the engine if 30% of the energy is wasted in the process.*
42. *A water pump of power 1.5KW draws water through a mean height of 10m to fill a tank 4m x 3m x 4m. Calculate the time taken to fill the tank.*
    Discuss the variation of acceleration due to gravity with (a) depth (b) altitude (c) shape of the earth
43. *Derive the expression for (1) escape velocity (b) orbital velocity*
44. *Derive the expression for (1) gravitational potential (2) gravitational potential energy.*
45. *Obtain the expression for 'g'*

THE END