FIRST YEAR HIGHER SECONDARY EXAMINATION

PHYSICS MODEL QUESTION

Time: 2Hrs Max Score : 60

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Answer any 5 questions from 1-7 . Each carries I score (5×1=5)

1. Pick out the unit less dimensionless Physical quantity

   (strain, angle, frequency , modulus of elasticity)

2. The SI unit of Surface Tension is - - -
3. The area under velocity- lime graph gives

   (acceleration, velocity, displacement , force.)

4. The position -time graph of two objects A & B are given below

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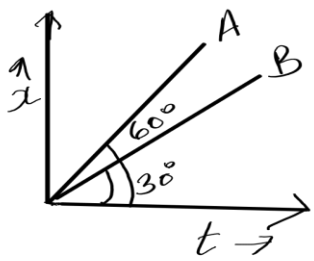

   which object has greater velocity?

5. Acceleration due to gravity is maximum at - - - - (Poles / equator)
6. Heat Transfer from the sun reaches to earth by the method of - - - -
7. Sound wave is - - - (Longitudinal / transverse)

Answer any 6 questions from 8-14 . Each carries 2 score (2x6= 12)

8. A ball is dropped from the top of the tower of height 45 m. Find the velouty with which the ball hits the ground. (2)
9. At what height 'h' the value of g will be half of that on the surface of earth? (2)
10. slate and prove work-energy therom for constant force. (2)
11. write any four Postulates of Kinetic theory of gas. (2)

12. A cricket ball is thrown at an angle of 30° with a speed of 28m/s. calculate the maximum height reached by the ball. (2)

13. Obtain the expression for maximam height reached by the body.(2)

14. a) Rotational analonge of mass is- - - (1)

b) give an example for Positive and negative work (1)

Answer any 4 questions from 1 5-21 . Each carries 3 Score (4×3=12)

15. A hot body cools by exchanging heat with the surroundings.

a) State Newtons Law of cooling. (1)

b) A body cools from 80° C to 50°c in 5 minutes. Cal culate the time taken to cool from G°C to 30°C. The temperature of surrounding is 20° C (2)

16) a) State Law of conservation of linear momentum. (1)

b) Prove the law using Newton's Second law of motion (2)

17) Dimensional analysis is used to check the correctness of an equation.

a) State the principle used in dimensional analysis (1)

b) Check the correctness of the equation V= Aut

v- volume , A- Area,t _ time,u- initial velocity. (2)

18. Draw the stress-strain graph of a loading wire and mark the following points.

a) Elastic limit b) Fracture point

c) Plastic region d) Elastic region (3)

19) Explain the principle and working of a hydraulic lift (3)

20. Prove the law of conservation of mechanical energy of a freely falling body. (3)

21. A sonometer wire vibrates in the third harmonic

a) Write the equation for its frequency (1)

b) Represent it pictorially and mark nodes and antinodes. (2)

Answer any 4 questions from 22-25 . Each carries 4 score. (4x 4= 16)

22. Derive the relations

i) $S = ut + 1/2\ at^2$

i i) $v^2 = u^2 + 2as$ (4)

23. a) Define uniform circular motion (1)

b) Derive the expression for centripetal acceleration (3)

24. a) obtain the relation between Torque and angular momentum (2)

b) State the law Of Conservation of angular momentum (2)

25) a) Derive the expression for total energy of a Simple harmonic oscillator (3)

b) Draw the graphical variation . of KE, PE and total energy (1)

Answer any three questions from 26-29. Each carries 5 Score (3×5=15)

26. Carnot engine is a device which converts heat energy into mechanical energy.

a) What is the working substance in a carnot engine (1)

b) Explain the process involved in a carnot engine with a P_V diagram (3)

c) What is the efficiency of a carnot- engine working between 20°c and 80°C (1)

27 . The escape speed for an object from earth is 11.2k m/s .

a) What is meant by escape speed (1)

b) Arrive the expression for escape speed from earth (2)

c) Explain whether the escape speed depends on mass of object or not (1)

d) Earth contains an atmosphere while moon does not. why? (1)

28. In the case of fluid law of conservation of energy can be explained with Bernoulli's principle. state and Prove the principle (2+3)

29. a) Draw the different forces acting on a vehicle moving through a banked road considering friction (2)

b) Derive the expression for maximum permissible speed of a vehicle on a banked road. (2)

c) If banking angle is 5° and radius of road is 20m, what is maximum safe speed (1)

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