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SAMPLE QUESTION PAPER

FIRST YEAR HIGHER SECONDARY EXAMINATION MARCH 2023

PART III: PHYSICS

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Duration: 2 Hrs

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Maximum Score: 60

Cool off time: 15 Minutes

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Answer any 5 from 1-7.Each question carries 1 mark

1.Area under the velocity time graph gives.........................

2.During oscillation of a pendulum at extreme position potential energy become ....and at mean position kinetic energy become ....3.As we move from equator to pole acceleration due to gravity ....(increases/decreases)

4.State Hooke's law.

5.Hydraulic machines works on the basis of ....

6.0K=................°c

7.In an isochoric process work done is..............

Answer any 5 questions from 8-14. Each question carries 2 mark.

8.Name two physical quantities which has unit but no dimension.

9.A man weighing 60kg lifts a mass of 10kg height of 10 m .Calculate work done by man in this process?

10.Write an equation for moment of inertia? Write any two factors on which moment of inertia depends?

11.State Newton's law of gravitation? Write its mathematical form?

12.Draw the stress-strain curve curve for a loaded metallic wire. Mark elastic limit and fracture point on the graph.

13.To keep a piece of paper horizontal, you should blow over,not under it. Explain.

14.When do real gases behave like ideal gas? Justify your answer.

Answer any 6 from 15-22. Each question carries 3 marks

15) A ball is thrown vertically upward with a velocity of 20m/s from the top of a multi-storey building. The height of the point from where the ball is thrown is 25.0m from the ground. (a) How high will the ball rise.

b)How long will it be before the ball hits the ground. Take $g=10m/s^2$

16)Draw the velocity -time graph of uniformly accelerated motion. From graph derive the equations $v=u+at$, $s=ut+\frac{1}{2}at^2$.

17) Two vectors are inclined at an angle Ө. Derive an expression for magnitude of resultant vector.

18)State law of conservation of linear momentum. Find an expression for recoil velocity of gun.

19)Obtain the relation between torque and angular momentum.

20)Give reason ,

 I) Why burns from steam are more serious than from boiling water

 II)Why cooking is difficult on hill top.

 III)Why invar is used for making pendulum

 21)Derive an expression for the centripetal acceleration of a body under uniform circular motion .

22)Derive an expression for time period of a spring under SHM .Also draw the variation of energy of the spring with position.

**Answer any three from 23-26.Each question carries 4 marks.**

23) a)Define stopping distance. Give its equation.

b)calculate the retardation of a car moving with a speed   of 80km/h that comes to a stop after traveling 200m.

c)What happens to the stopping distance if its initial velocity is doubled.

24) a)A lorry and car moving with same kinetic energy are stopped by applying same brakes which provides the same retardation . Which of them will come to a rest in a shorter distance.

 b)If the kinetic energy of a body is doubled what is the percentage change in its linear momentum.

25)Carnot Engine is a reversible heat engine working between two temperatures.

 a) Name the thermodynamic processes in a Carnot engine.

 b) Draw the Carnot cycle and derive an expression for the total work done in a Carnot engine. (1+1+2)

26)Draw the standing wave patterns on a stretched string, for the first ,second and the third mode of vibration. Write the equation for the corresponding frequencies.

Answer any three from 27-30.Each question carries 5 marks

27) 1.Derive equations for a)Maximum height and b)Horizontal Range of a projectile.

 2.A food packet is dropped from a plane flying horizontally. If the time taken for the packet to reach the earth's surface is 6 sec. Calculate the height from which the packet is dropped.

28) a) Arrive at an expression for the maximum safe speed on a banked road.

   b)A cyclist speeding at 18Km/h on a level road takes a sharp circular turn of radius 3m without reducing the speed. The coefficient of static friction between the tyres and road is 0.1. Will the cyclist slip while taking the turn.

29) Derive an equation for variation of g at a depth d .At what height will the value of g be half of that on the surface of earth.

30)a)Obtain an expression for excess pressure inside a drop of radius r and the surface tension S.

b) Two soap bubbles A and B are blown at the ends of a tube. On removing the block C what happen to the sizes of A and B
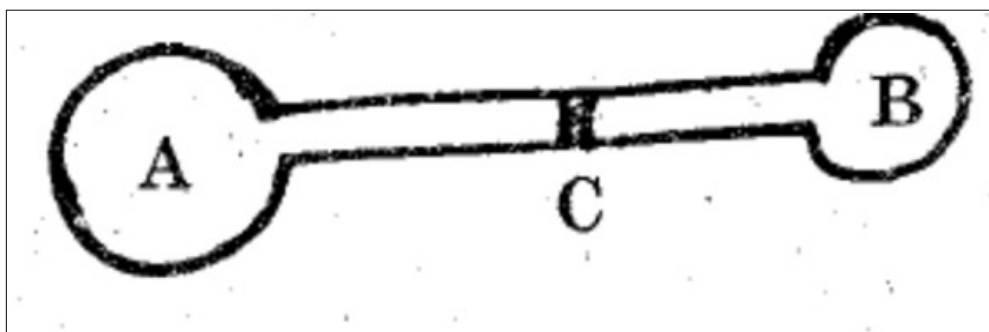
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