Reg. No.: …………………………………………………….

Name: ………………………………………………………..

FIRST YEAR HIGHER SECONDARY EXAMINATION SAMPLE QUESTION PAPER

Part III

PHYSICS

Time: 2 Hours

Cool-off time: 15 Minutes

Maximum : 60 Scores

General Instructions to Candidates.

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Use the 'Cool of time' to get familiar with questions and to plan your answers
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non programmable calculators are not allowed in the examination hall.

Answer any 5 questions from 1 to 7 **(5x1=5 scores)**

1. The ratio of velocity to speed of an object is....................

i. One

ii. Greater than one

iii. Less than one

iv. Either less than one or equal to one.

2. Newton's first law of motion describes the ....

(a) energy

(b) work

(c) inertia

(d) momentum

3.When two object collide, after collision they could move together, the collision is........

(elastic, completely elastic, inelastic, completely inelastic)

4.The value of acceleration due to gravity is maximum at the______________

a)poles b)equator c) centre of the earth.

5.Viscosity of gases ____________ with temperature

(increases/decreases)

6.A girl is swinging on a swing in a sitting position. When she stands up , the period of the swing will______ (increase/decrease).

7.Velocity of sound in vacuum is

a) 330 m/s b) 165 m/s c)zero d) 660 m/s

Answer any 5 questions from 8 to 14 (5x2= 10 scores)

8. Give examples for the following:

a) A dimensionless, unit less physical quantity.

b)A dimensionless physical quantity but having unit in SI system.(2 marks)

9.State Newtons second law of motion and arrive at an expression for force.(2)

10.Find out the sign of work done in the following cases :

(a) Work done by a man in lifting a bucket out of a well.

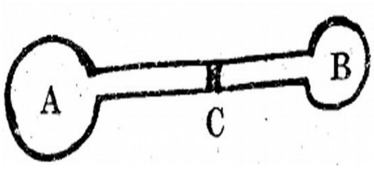
(b) Work done by friction on a body sliding down an inclined plane.

(c) Work done by an applied force on a body moving on a rough horizontal plane.

(d) Work done by the resistive force of air on a vibrating pendulum (2)

11. Show that $\vec{\tau} = dL/dt$ for rotational motion.(2)

12.Two soap bubbles A and B are blown at the ends of a tube,



Choose the correct answer:

When the block C is removed...

i. The size of A increases and that of B decreases

ii. The size of B increases and that of A decreases

iii. No change occurs in their sizes

iv. Their sizes become equal.

13.Write any four postulates of the kinetic theory of gases.

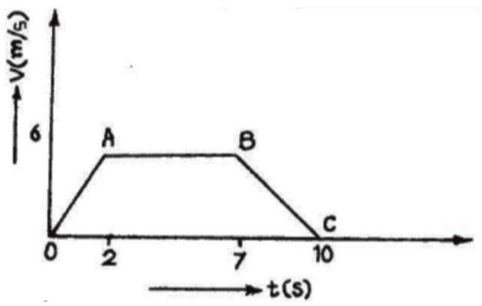
14.What is seconds pendulum ?. Find its length.

Answer any 6 questions from 15 to 21 (6x3= 18 scores)

15. a)State principle of homogeneity of dimensions.

b)A physical quantity is given by $h = Fv^2/L$. F is the force, v is the velocity and L is the angular momentum. Find the dimensions of h .

16.



a) Which portion of the graph represents uniform retardation?

(i) OA

(ii) AB

(iii) BC

(iv) OC

b) Find the displacement in time 2s to 7s. (1+2)

17.The parallelogram law is used to find the resultant of two vectors. Derive an equation to find the magnitude of the resultant of two vectors in terms of their magnitudes and angle between them.(3)

18. a) State and prove that the law of conservation of energy for a freely falling body.

b) Draw graphically the variation of kinetic energy and potential energy with the height of the body in the above case.

19. .a) State the law of conservation of angular momentum.

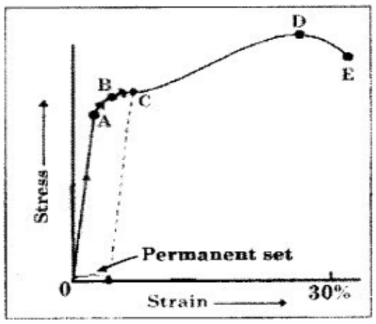
b)A girl rotates on a swivel chair as shown below.

What happens to her angular speed when she stretches her arms?Why?(1+2)

20. Derive an expression for escape speed from a planet.(3)

21.State Hooke’s law.

A typical stress-strain graph of a metallic wire is shown below



a)Write the name of the point B labelled in the graph.

b)For materials like copper, the points D and E are .... (close/far apart).(3)

Answer any 3 questions from 22 to 24 (3x4= 12 scores)

22.(a) Define uniform motion.

(b) Draw the velocity – time graph of an uniformly accelerated motion.

(c) Using the graph obtain the equation $x = ut + 1/2at^2$.(1+1+2)

23.The acceleration due to gravity (g) on the surface of the earth is 9.8 m/s 2 .

a) Define the acceleration due to gravity (g).

b) Derive an expression for the variation of g at a depth ‘d’ below the surface of earth.(1+3)

24. Heat energy is transferred from one body to another due to temperature difference.

(a) What are the different modes of heat transfer ?

(b) Explain how sea breeze occurs.

(c) The bottoms of the cooking vessels are blackened. Give reason.(1+2+1)

Answer any 3 questions from 25 to 28 **(3x5= 15 scores)**

25.When a body is projected into air with certain initial velocity making an angle with the horizontal, it will travel along a parabolic path.

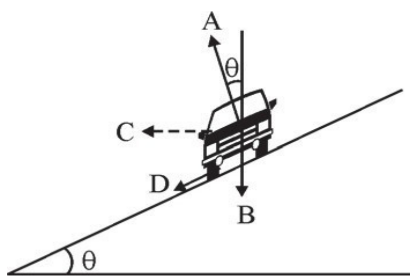
a) What are the vertical and horizontal components of velocity?

b) With a diagram, derive an expression for

i. Maximum height

ii. Time of flight.

26.Circular motion of a car on a banked road is shown in figure



a)Write the name of forces A, B, C, D in the figure.

(b)Derive an expression for the maximum safe speed of the car.(2+3 marks)

27.State and explain Bernoulli's principle (5)

28. Carnot cycle for a heat engine works with an ideal gas as the working substance.

a) Draw the Carnot cycle and explain its working.

b) A Carnot engine is working between two temperatures of 27º C and 327ºC.

Find its efficiency (3+2)

Prepared by

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