

SAMPLE QUESTION PAPER

Reg No:
Name:

SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 2023

Part – III
PHYSICS
Minutes
Maximum: 60 scores

Time: 2 Hrs
Cool-off time: 15

General Instructions to Students

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

വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ

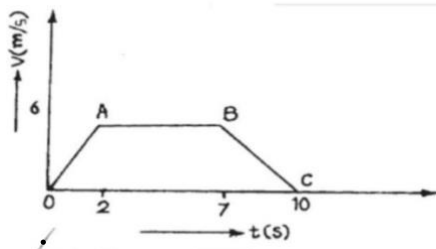
- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിറ്റ് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും.
- "കൂൾ ഓഫ് ടൈം" ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കുട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തര പേപ്പറിൽ ഉണ്ടായിരിക്കണം
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ മെകാടുകണം
- പ്രോഗ്രാം ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെ ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാ ഹോളിൽ ഉപയോഗിക്കാൻ പാടുള്ളതല്ല

Answer any five questions from 1 to 7. Each question carries one score. (5*1 =5)

- 1) Find the odd one out
 - a. Light year
 - b. Parsec
 - c. Second
 - d. Angstrom
- 2) Newton's first law of motion describes
- 3) Work done by frictional force is always.....
- 4) Slope of velocity-time graph gives
 - a. Position
 - b. Displacement
 - c. Acceleration
 - d. work
- 5) Water has maximum density at
 - a. 0° C
 - b. 4° C
 - c. -4° C
 - d. 273° C
- 6) Horizontal range is maximum at an angle of projection
 - a. 35°
 - b. 45°
 - c. 90°
 - d. 180°
- 7) Rotational analogue of mass is

Answer any five questions from 8 to 14. Each question carries two scores. (5*2=10)

- 8) Velocity time graph of a body is given below



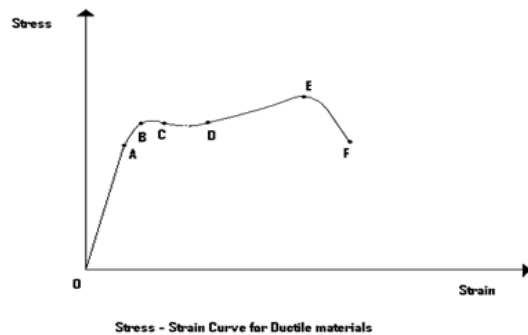
- a. Which portion of the graph represents uniform retardation?
 - i. OA
 - ii) AB
 - iii) BC
 - iv) OC
- b. Find the displacements in time 2s to 7s.
- 9) Show that the range will be the same for two angles of projection with same initial velocity.
- 10) State and explain Kepler's law of area.
- 11) Match the following

A. Isothermal process	E. Pressure constant
B. Isochoric process	F. Temperature constant
C. Isobaric process	G.No heat exchange
D. Adiabatic process	H.Volume constant
- 12) Write down any two postulates of kinetic theory of gases.
- 13) If force $\mathbf{F}=3\mathbf{i}+4\mathbf{j}-5\mathbf{k}$ N acting on a body produces a displacement of $\mathbf{d}=5\mathbf{i}+4\mathbf{j}-3\mathbf{k}$ m , then find the work done by the force.

14) At what position the KE of a simple harmonic oscillator becomes equal to its potential energy.

Answer any six questions from 15 to 21. Each question carries three scores. (6*3=18)

15) The stress-strain curve for a metal is given in the figure.



- Mark 1. elastic limit 2. Permanent set 3. Yield point
4. Fracture point 5. Proportional limit 6. Elastic region

16) Show that coefficient of area expansion is two times that coefficient of linear expansion.

17) What is impulse? Show that impulse is equal to change in momentum.

18) Obtain an expression for the work done in an isothermal process.

19) Derive the expression for period of oscillation of a simple pendulum.

20) State and prove the law of conservation of mechanical energy for a freely falling body.

21) State Pascal's law for transmission of fluid pressure. Briefly explain the working of hydraulic lift.

Answer any three questions from 22 to 25. Each question carries four scores (3*4=12)

22) a. Name and state the principle used to check the correctness of an equation.

b. Find the dimensional formula of gravitational constant G and Planck's constant h.

[Hint: $F = Gm_1m_2/r^2$, $\lambda = h/p$]

23) a. What is banking of roads?

b. with the help of a neat diagram, derive the expression for maximum permissible speed for a vehicle in a banked road in the presence of friction.

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

b. Show that $dL/dt = \tau$

25) Draw the different modes of standing waves produced in a stretched string fixed at both

ends. Prove that the frequencies produced in a stretched string fixed at both ends are in the ratio 1:2:3

Answer any three questions from 26 to 29. Each question carries five scores. (3*5=15)

- 26) A particle is moving along x axis with uniform acceleration
- Obtain an expression for displacement by drawing v-t graph.
 - A ball is thrown vertically upward with a velocity of 10m/s from the top of a tower of height 15m from the ground. How long does it remain in the air?
- 27) a. What are the values of acceleration of a projectile at vertical and horizontal direction? (1)
- With the help of a diagram, derive the expression for time of flight and horizontal range of projectile. (4)
- 28) a. Obtain the expression for acceleration due to gravity at a height 'h' above the surface of the Earth. (3)
- A mass of 30kg is taken from earth to moon. What will be its mass and weight on the surface of moon. (2)
- 29) a. State and prove Bernoulli's theorem? (4)
- Write any two characteristics of the fluids obey Bernoulli's theorem. (1)

Prepared by members of Tirur Cluster.

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