

ගම්පහ අධ්‍යාපන කලාපය
Gampaha Education Zone

දෙවන වාර ඇගයීම -2025
Second Term Evaluation - 2025
இரண்டாம் துவணைப் பரீட்சை - 2025

ශ්‍රේණිය
Grade

13

විෂයය
Subject

Physics I

කාලය
Time

2 Hrs

නම
பெயர்
Name

• Answer all the questions

01. Unit of electric field intensity (\vec{E}),

(A) $C m^{-1}$

(B) $V m^{-1}$

(C) $J m^{-1} C^{-1}$

(D) $N C^{-1}$

1) (B) and (C) only

2) (A), (B) and (C) only

3) (A), (C) and (D) only

4) (B), (C) and (D) only

5) (A), (B) and (D) only

02. The length of (n-1) divisions of a main scale is d and that length is divided into vernier divisions.

The least count of the instrument,

1) $\frac{d}{n}$

2) $\frac{d}{n(n+1)}$

3) $\frac{d}{n-1}$

4) $\frac{d}{n(n-1)}$

5) $\frac{dn}{n-1}$

03. A and B are two mercury in glass thermometer. Volume of bulb A is equal to the volume of bulb B, But radius of capillary of A twice of that of B. When temperature of both bulbs are increased by $2^{\circ}C$,
Change of length of mercury column in A [Neglect expansion of glass]
Change of length of mercury column in B

1) $\frac{1}{8}$

2) $\frac{1}{4}$

3) $\frac{1}{2}$

4) 2

5) 4

04. The change of intensity level of sound is 20 dB, the ratio between two intensities.,

1) 0.1

2) 10

3) 20

4) 100

5) 110

05. Gap between two lenses of an astronomical telescope is 66 cm and its angular magnification at normal adjustment M. When the object is observed only through objective lens, magnification 0.01 M. The focal length of objective lens,

1) 6 cm

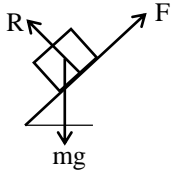
2) 10 cm

3) 33 cm

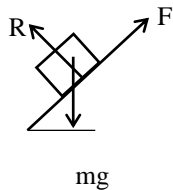
4) 60 cm

5) 33 cm

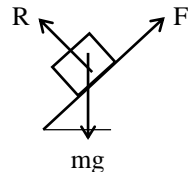
06. An object is placed on a rough inclined plane at limiting equilibrium, correct force diagram,



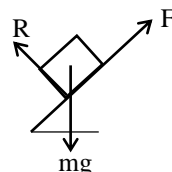
1)



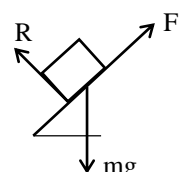
2)



3)

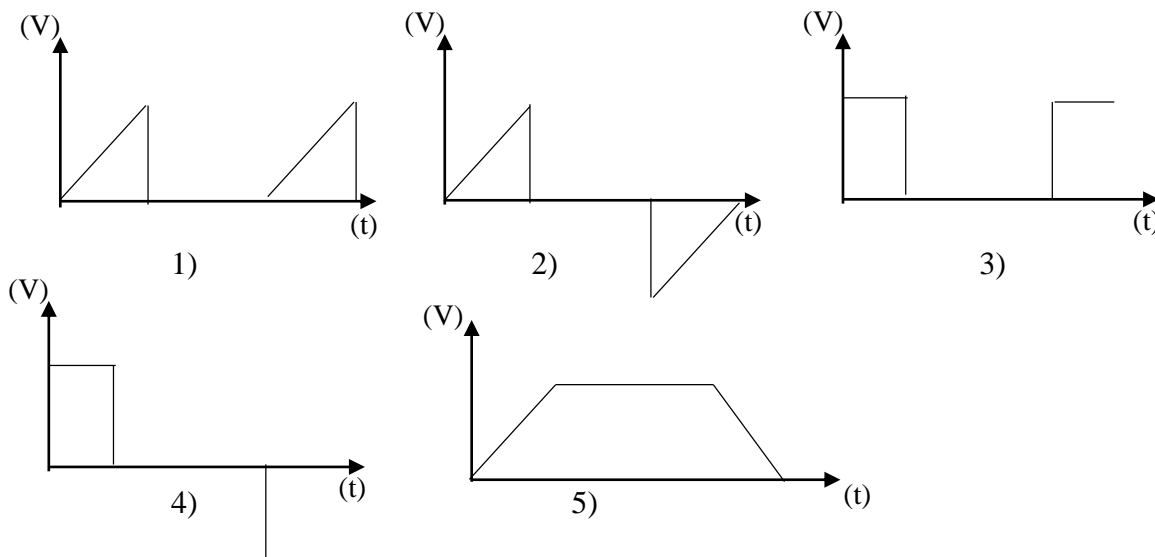
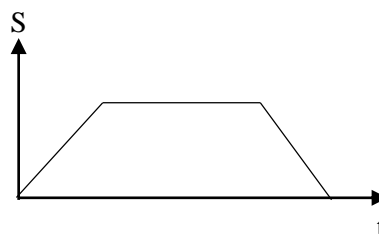


4)



5)

07. Displacement (s) - time (t) graph for a particle is given,
Corresponding velocity(v) - time(t) graph.



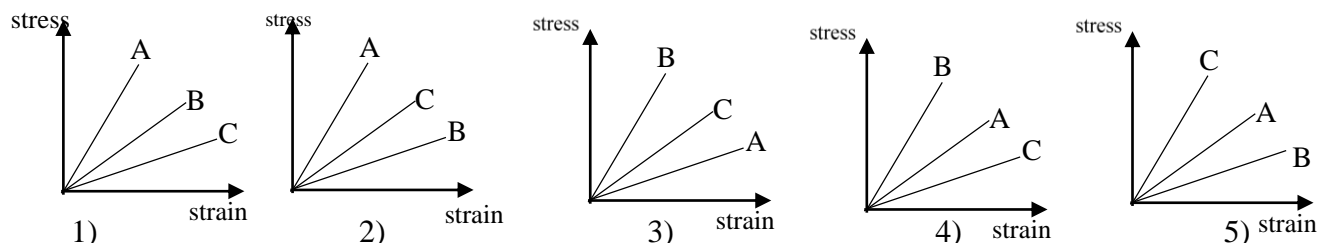
08. When two liquids A and B at 12°C and 19°C are mixed, the final temperature of the mixture is 16°C . The ratio between specific heat capacities of liquids B and A are,

- 1) $\frac{3}{5}$ 2) $\frac{5}{4}$ 3) $\frac{4}{3}$ 4) $\frac{3}{2}$ 5) $\frac{5}{3}$

09. Radius and gravitational field intensity on the surface of the earth are R and g respectively. When a rocket is projected vertically upward at velocity V, The maximum height is h. (Neglect air resistance)
The correct statetment,

- 1) $h = \left[\frac{R}{\frac{2gR}{v^2} - 1} \right] - R$ 2) $h = \left[\frac{R}{\frac{2gR}{v^2} + 1} \right] - R$ 3) $h = \left[\frac{R}{\frac{2gR}{v^2} - 1} \right] + R$
4) $h = R \left[\frac{2gR}{v^2} + 1 \right]$ 5) $h = \left[\frac{R}{1 - \frac{v^2}{2gR}} \right] - R$

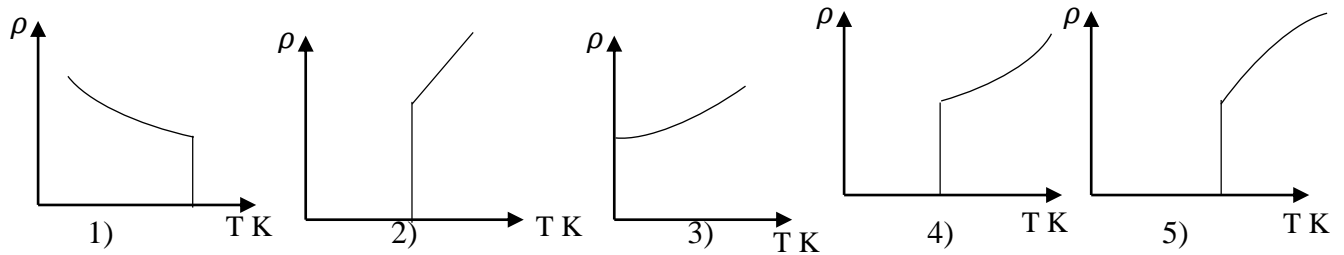
10. Three wires A, B and C having same radius and lengths are, subjected to extension in the limit of elasticity. The relation ship among their young's modulus is $E_A = 2E_B = 3E_C$, the correct variation of stress again strain.



11. Lower fixed temperature and upper fixed temperature of an erroneous thermometer are -0.2°C and 99.6°C . What is the correct temperature, when this thermometer reads 30°C

- 1) 30.38°C 2) 30.06°C 3) 29.94°C 4) 29.74°C 5) 28.26°C

12. What is the correct variation of resistivity ρ with absolute temperature (T) for a super conductor.,



13. Frequency of tuning fork A is 256 Hz when it is sounded simultaneously with tuning fork B, it produces 15 beats in 5 seconds, when the prong of B is loaded by small amount of wax it produces 10 beats in 5 seconds. When B is sounded with a tuning fork of frequency 252 Hz, no of beats per second should be ,

- 1) 12 2) 11 3) 7 4) 6 5) 0

14. There is a circular hole in a steel plate. The fractional change of area when it is heated by 100°C is 2.4×10^{-3} . The linear expansivity of sheet is,

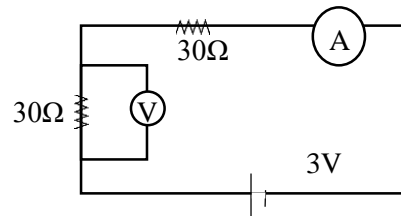
- 1) $12 \times 10^{-5} \text{ }^{\circ}\text{C}^{-1}$ 2) $1.2 \times 10^{-5} \text{ }^{\circ}\text{C}^{-1}$ 3) $1.2 \times 10^{-4} \text{ }^{\circ}\text{C}^{-1}$
4) $12 \times 10^{-4} \text{ }^{\circ}\text{C}^{-1}$ 5) $1.2 \times 10^{-6} \text{ }^{\circ}\text{C}^{-1}$

15. Angular velocity at the second hand of the clock is,

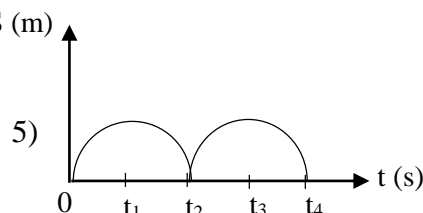
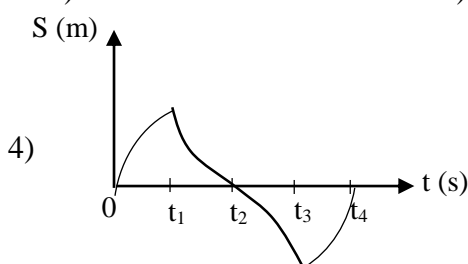
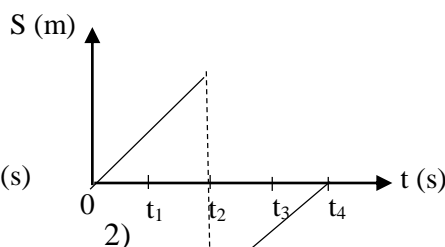
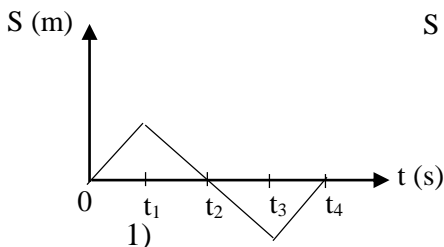
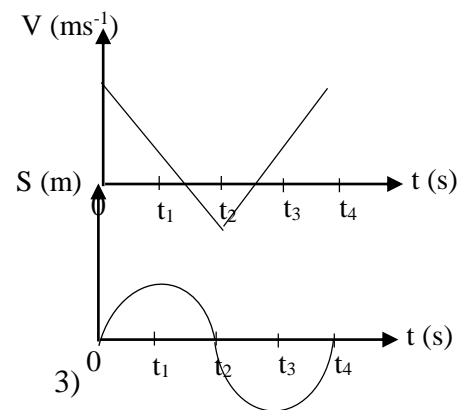
- 1) $\frac{\pi}{180} \text{ rad s}^{-1}$ 2) $\frac{\pi}{60} \text{ rad s}^{-1}$ 3) $\frac{\pi}{30} \text{ rad s}^{-1}$ 4) 60π 5) 180π

16. What are the readings of ammeter and voltmeter. when these are interchanges in the circuit given in figure. (A and V are ideal)

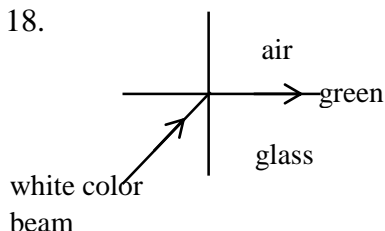
- 1) 0 A, 0 V 2) 0 A, 1.5 V
3) 0.05 A, 1.5 V 4) 0A, 3V
5) 0.05A, 3V



17. Corresponding displacement - time graph for the given velocity - time graph,



18.



When a beam of white colour light falls on the interface of glass and air. green colour light goes along the interface light of colour reflected totally. Speed of blue and red light in glass are $1.96 \times 10^8 \text{ ms}^{-1}$ and $1.99 \times 10^8 \text{ ms}^{-1}$ respectively.

1) Blue, Violet

2) Blue, Green, Yellow

3) All colours

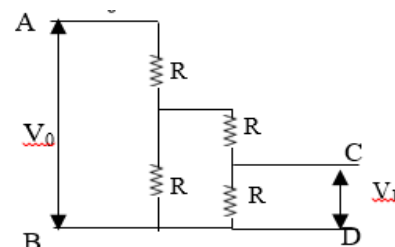
4) Yellow, Orange, Red

5) All colours except green

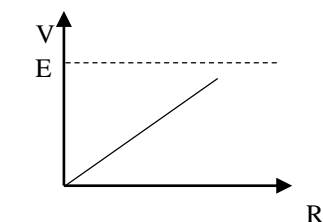
19. If potential difference between A and B is V_0 and potential difference between C and D is V_1 then $\frac{V_1}{V_0}$

1) $\frac{2}{5}$ 2) $\frac{1}{5}$ 3) $\frac{5}{2}$ 4) $\frac{2}{3}$

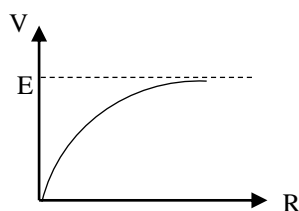
5) 0



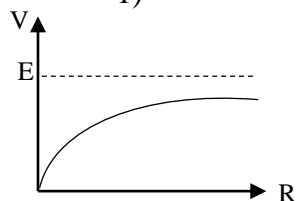
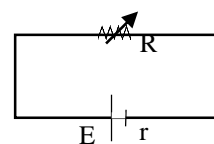
20. In the circuit given in figure, the electromotive force and internal resistance of cell are E and r respectively. What is the correct variation of potential difference, across the terminals of a cell, with external resistance R .



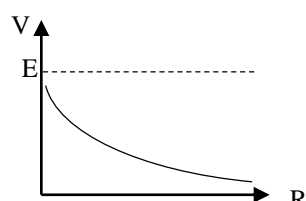
1)



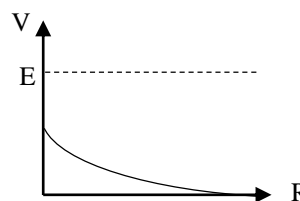
2)



3)



4)



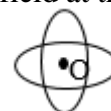
5)

21. Information for three rods A, B and C are given A compound rod is made by connecting three rods in series The young's modules of compound rod is,

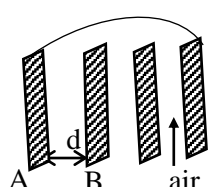
1) $\frac{y}{8}$ 2) $\frac{8y}{7}$ 3) $\frac{8y}{5}$ 4) y 5) $\frac{5y}{4}$

rod	length	young's modules
A	l	$2y$
B	l	y
C	$2l$	$2y$

22. Two concentric circular rings having radius R of each are placed in two perpendicular plane. frequency of rotation of two charges q in two rings is f . Flux density of induces magnetic field at the center is,

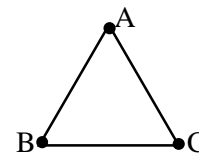
1) $\frac{\mu_0 q f}{2R}$ 2) $\frac{\mu_0 q f}{2\pi R}$ 3) $\sqrt{2} \frac{\mu_0 q f}{2\pi R}$ 4) $\sqrt{2} \frac{\mu_0 q f}{2R}$ 5) $\frac{\mu_0 q f}{\pi R}$ 

23. Four parallel plates each having area A and having same gap d are placed in air the equivalent capacitance between A and B.,

1) $\frac{A\epsilon_0}{3d}$ 2) $\frac{2A\epsilon_0}{3d}$ 3) $\frac{3A\epsilon_0}{2d}$ 4) $\frac{A\epsilon_0}{2d}$ 5) $\frac{3A\epsilon_0}{4d}$

24. Three point charges $20 \mu\text{C}$, $40 \mu\text{C}$ are $30 \mu\text{C}$ are placed on vertices of ABC equilateral triangle of length 10.0 cm. Potential energy of the system ($\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2\text{C}^{-2}$)

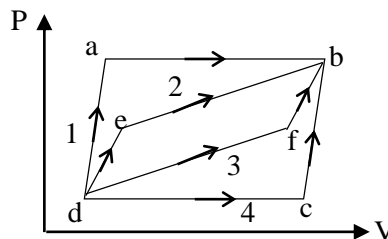
- 1) 54 J 2) 108 J 3) 234 J 4) 72 J 5) 180 J



25. P -V- curves for four thermodynamic process (1, 2, 3, 4) are given in figure. Consider following statement made regarding the heat absorbed by the system Q and work done by the gas W and change of internal energy u.

- (A) $W_1 > W_2 > W_3 > W_4$
 (B) $Q_2 - W_2 > Q_3 - W_3$
 (C) $Q_1 - Q_4 = W_1 - W_4$
 (D) $Q_1 > Q_2 > Q_3 > Q_4$

true statement / statements,

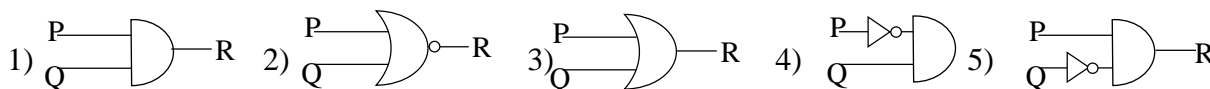


- 1) Only B 2) Only C 3) B and D only 4) A and C only 5) A, C and D only

26. When one end of lagged rod of length l, radius r and thermal conductivity K is placed in steam bath and other end is placed in ice bath the rate of melting ice is 0.1 g s^{-1} . What should be the rate of melting ice when and another rod having length $l/2$ radius $2r$ and heat conductivity $k/4$ is used

- 1) 0.1 g s^{-1} 2) 0.2 g s^{-1} 3) 0.8 g s^{-1} 4) 1.6 g s^{-1} 5) 3.2 g s^{-1}

27. P and Q are two inputs and R is the out put for a logic gate, When $P = 1$, $Q = R$ and when $P = 0$, $R = 0$ that logic gate should be,

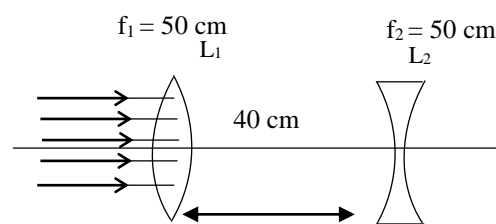


28. A vehicle moving under the steady velocity takes 50 s to travel between two posts located 600 m apart. If the velocity of vehicle when it passes 1st post is 9 m s^{-1} then velocity of vehicle when it passes the second post is,

- 1) 12 m s^{-1} 2) 13 m s^{-1} 3) 15 m s^{-1} 4) 18 m s^{-1} 5) 2 ms^{-1}

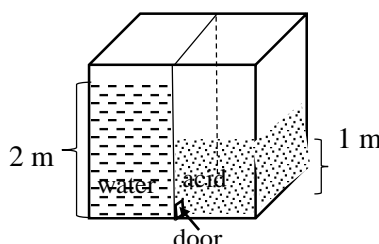
29. A convex lens and concave lens each having focal length 50 cm are placed co-axially 40 cm apart when a parallel beam of light falls on the convex lens, the final image ,

- 1) Real and 22.2 cm from L_2
 2) Virtual and 22.2 cm from L_1 .
 3) Real and 12.5 cm from L_2
 4) Virtual and 12.5 cm from L_2 .
 5) Virtual and 10 cm from L_2



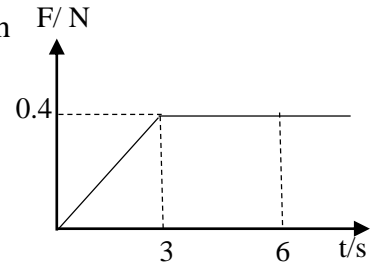
30. A tank having rectangular cross section is separated in to two chambers using a vertical wall. There is a small hole closed by a door of $4 \text{ cm} \times 4 \text{ cm}$. Water is filled up to 2 cm in one chamber and acid of relative density 1.2 is filled 1 m up to in other chamber. Magnitude and direction of the required force to prevent opening the door. (density of water 1000 kg m^{-3})

- 1) 6.4 N towards and from water
 2) 12.8 N towards acid from water
 3) 6.4 N towards water from acid
 4) 12.8 N towards water from acid
 5) 16 N towards water from acid



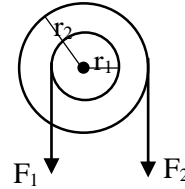
31. Variation of force applied on a block of mass 5 kg placed on smooth horizontal surface with time is given in figure velocity after 6 s is,

- 1) 0.18 m s^{-1} 2) 1.8 m s^{-1} 3) 0.27 m s^{-1}
 4) 0.36 m s^{-1} 5) 3.6 m s^{-1}



32. Masses and radii of two co-axial pulleys are m_1 and m_2 and r_1 and r_2 respectively. As shown in figure two tangential forces F_1 and F_2 are applied as shown in figure. The angular acceleration of the system (moment of inertia of the system is $I = \frac{1}{2} m r^2$)

- 1) $\frac{2(F_2 r_2 + F_1 r_1)}{m_1 r_1^2 + m_2 r_2^2}$ 2) $\frac{F_2 r_2 - F_1 r_1}{m_1 r_1^2 + m_2 r_2^2}$ 3) $\frac{(F_2 r_2 - F_1 r_1)^2}{m_1 r_1^2 + m_2 r_2^2}$
 4) $\frac{2(F_2 r_2 - F_1 r_1)}{m_1 r_1^2 + m_2 r_2^2}$ 5) $\frac{(F_2 r_2 - F_1 r_1)}{2(m_1 r_1^2 + m_2 r_2^2)}$

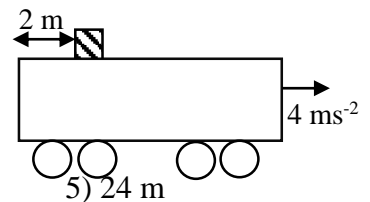


33. Specification of filament bulb is 24 W and 12 V. Amount of charge flown in the period of 5 minutes,

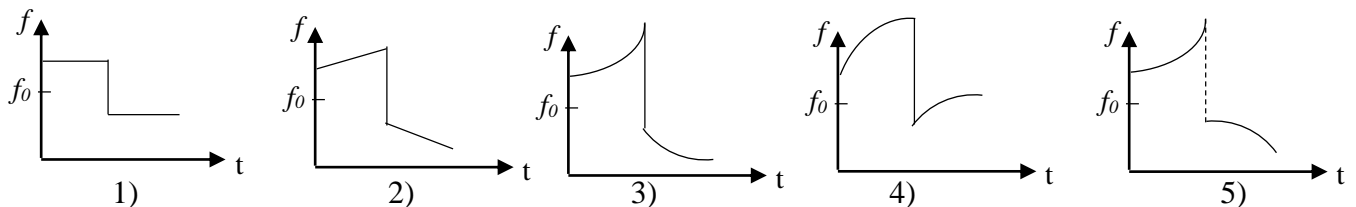
- 1) 2C 2) 600 C 3) 3600 C 4) 120C 5) 1200C

34. A block of mass 5 kg is placed on trolley 2 m before the back end of trolley coefficient of friction between trolley and the block is 0.3. Trolley is moving horizontally along the path at acceleration 4 ms^{-2} . The displacement of the trolley When block falls down from the trolley.

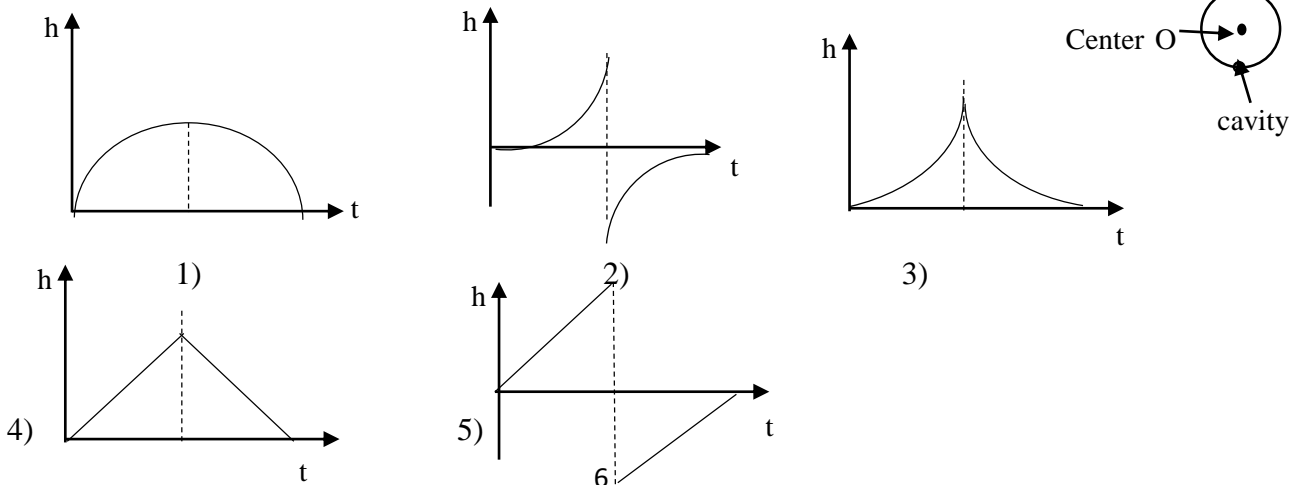
- 1) 4 m 2) 8 m 3) 16 m 4) 20 m



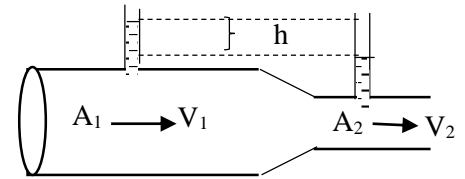
35. Train is moving a straight track of outstand acceleration and moving towards stationary observer standing on platform and passes him. the correct variation of observed frequency with time t ,



36. A spherical shell having cavity n is hung by using a light string and has been completely filled by water. From the small hole, located at the bottom, water is ejected at constant rate. The correct variation of the position of the center of gravity with time with respect to O,



37. Incompressible fluid flows along the, non uniform horizontal tube, having cross sectional area A_1 and A_2 at velocities. V_1 and V_2 receptivity, Height difference between liquid columns in two vertical arms is h . consider following statements.



- (A) Rate of volume flow is $A_1 V_1$
 (B) Total energy of unit mass is constant in both tubes
 (C) $V_2 - V_1 = \sqrt{2gh}$
 (D) $V_2^2 - V_1^2 = 2gh$

True statements

- 1) A and B only 2) A and D only 3) A, B and C only
 4) A, B and D only 5) B,C and D only

38. Object of mass m , moving at steady velocity at u on the horizontal plane and hits on an another object of mass nm , which is at rest. The ratio between kinetic energy gain by the object of mass nm after the collision and initial kinetic energy of the system,

- 1) $\frac{n}{(n+1)^2}$ 2) $\frac{4n}{(1+n)^2}$ 3) $\frac{4n}{(n-1)^2}$ 4) $\frac{2n}{(n+1)^2}$ 5) $\frac{6n}{(n+1)^2}$

39. Density of ice at 0°C is $d \text{ kg m}^{-3}$ and density of water is $\rho \text{ kg m}^{-3}$. Change of volume ΔV , when "m" mass of ice is completely converted into water,

- 1) $\frac{m}{\rho-d}$ 2) $\frac{m(\rho-d)}{\rho d}$ 3) $\frac{m(\rho-d)}{\rho+d}$ 4) $\frac{m\rho d}{\rho-d}$ 5) $\frac{m(\rho+d)}{\rho d}$

40. Efficiency of a step up transformer is 100% . In its primary and secondary coil.

- 1) Current same 2) No.of turns same 3) Voltage same
 4) Power same 5) Resistance same

41. Two identical waves having frequency 20 Hz moving in opposite direction at velocity 60 mm s^{-1} produces a stationary wave. The distance between two adjacent nodes.

- 1) 1 mm 2) 1.5 mm 3) 3.0 mm 4) 3.5 mm 5) 4.5 mm

42. Electro - magnetic wave of frequency f and wave length λ moving in air at speed C enters into a medium having refractive index n . frequency wave length and speed of wave in medium.

- 1) $f, \lambda, \frac{C}{n}$ 2) $\frac{f}{n}, \frac{\lambda}{n}, \frac{C}{n}$ 3) $f, \frac{\lambda}{n}, C$ 4) $\frac{f}{n}, \lambda, \frac{C}{n}$ 5) $f, \frac{\lambda}{n}, \frac{C}{n}$

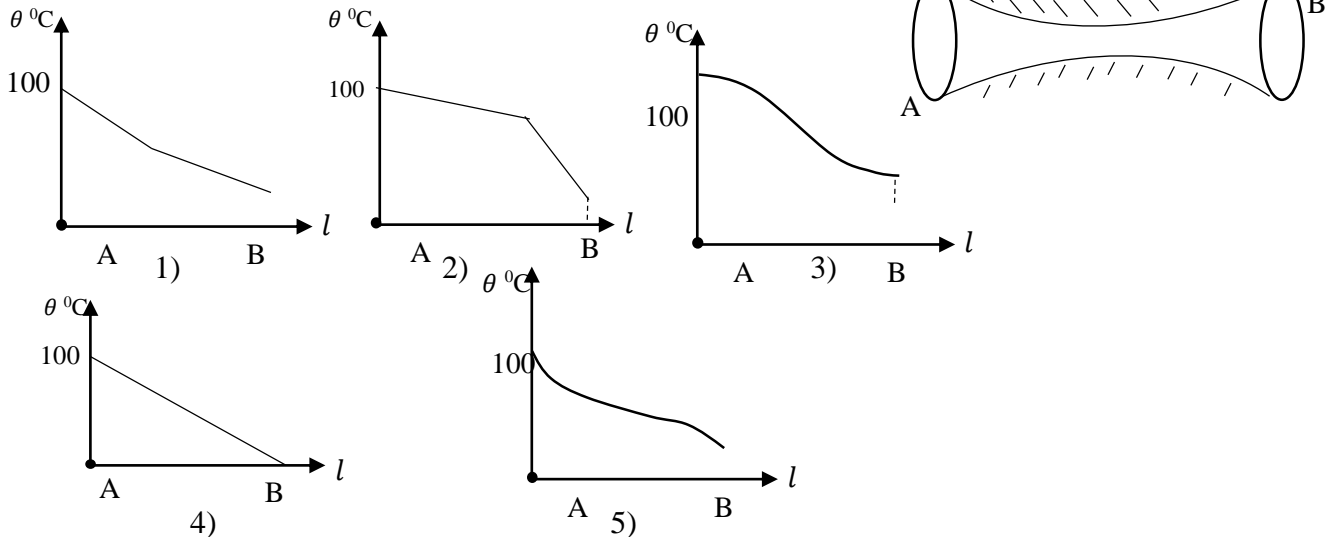
43. Property, which is shown by both waves and particles.

- 1) Interference and refraction 2) Diffraction and interference
 3) Diffraction and refraction 4) refraction and reflection
 5) Diffraction and refraction

44. Radius of the earth is R , Two satellites A and B are located in two orbits of radius $3R$ and $4R$. If the periodic time for both satellite is same the ratio between acceleration of A and acceleration of B,

- 1) $\frac{3}{2}$ 2) $\frac{9}{4}$ 3) $\frac{16}{9}$ 4) $\frac{4}{9}$ 5) $\frac{16}{7}$

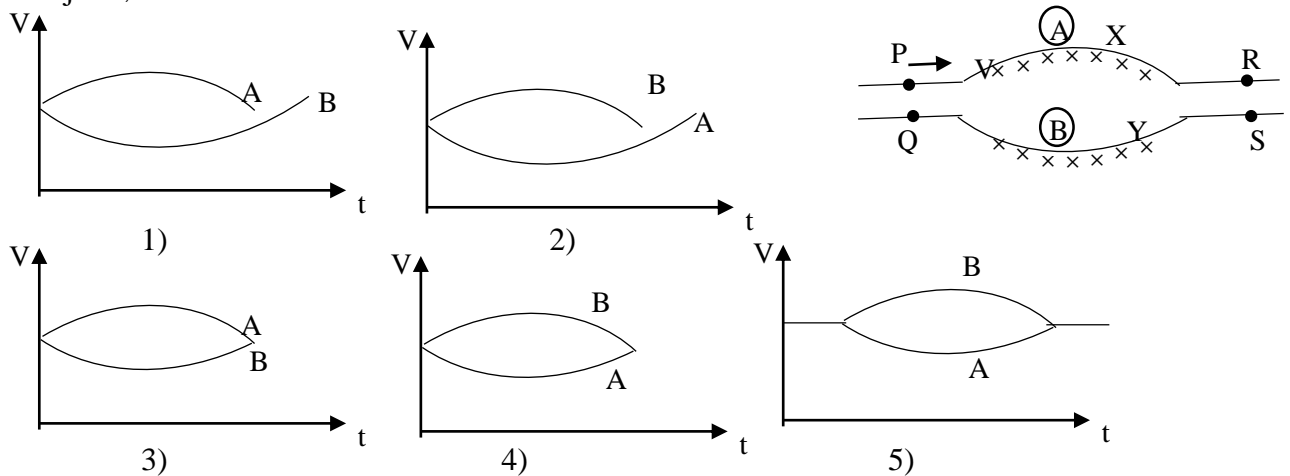
45. AB is a uniform lagged rod. Temperature at A and B are 100°C and 25°C . The correct variation of temperature along the axis at steady state,



46. Terminal velocity V_0 for a solid sphere moving in viscous fluid having very small density. If there is an internal cavity, terminal velocity of object is same medium is $\frac{V_0}{3}$, The ratio between volume of cavity and total volume of sphere is,

- 1) $\frac{1}{9}$ 2) $\frac{1}{3}$ 3) $\frac{1}{2}$ 4) $\frac{3}{1}$ 5) $\frac{2}{3}$

47. A and B two identical balls are entering into two smooth paths X and Y at points P and Q. Initial velocities of A and B are same. and both objects pass points R and S. Velocity - time graph for both objects,

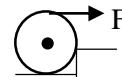


48. At 27°C speed of sound in air 300 m s^{-1} , speed of sound in air when the absolute temperature is increased by 21%,

- 1) 311 ms^{-1} 2) 321 ms^{-1} 3) 330 ms^{-1} 4) 345 ms^{-1} 5) 363 ms^{-1}

49. The minimum force F should be applied horizontally, to lift a cylinder of mass M and radius R from the edge of height $R/2$,

- 1) $\frac{Mg}{3}$ 2) $\frac{2}{3} Mg$ 3) $2 Mg$ 4) $\frac{\sqrt{3}}{2} Mg$ 5) $\frac{Mg}{\sqrt{3}}$



50. In the network given in figure there are 20 resistors each having resistance R . The equivalent resistance between A and B,

- 1) $R/2$ 2) $3R/5$ 3) $3R/4$ 4) R 5) $3R/2$

