

9TH STD SECOND TERM EXAMINATION 2023-24

PHYSICS ANSWER KEY

1.	$6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$						
2.	Adhesive force						
3.	0N						
4.	Joule(J)						
5.	(a) Relative density of a substance is defined as the ratio of density of a substance to density of water at 4°C (b) No, it will sink in kerosene since it is denser than kerosene						
6.	(a) The area under velocity-time graph gives the <u>magnitude of displacement</u> (b) The size of <u>the graph increases</u> as we decrease the scale considered, but the value does not change						
7.	<u>Newton's first law of motion</u> A body remains in the state of rest or uniform motion in a straight line unless and until an external force act on it						
8.	(a) 5m (b) 25G						
9.	Work done to move the object by the man is positive work Work done by the frictional force is negative						
10.	(a) Graph (2) (b) Graph (3)						
11.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Inertia of rest</th> <th style="width: 50%; text-align: center;">Inertia of motion</th> </tr> </thead> <tbody> <tr> <td>Dust comes out of a hanging mat when beaten with a stick</td> <td>Athletes take a short run before doing a long jump</td> </tr> <tr> <td>Passengers standing in a bus tend to fall backwards when the bus suddenly starts moving forward</td> <td>A fan continues its rotation for sometime even after it is switched off.</td> </tr> </tbody> </table>	Inertia of rest	Inertia of motion	Dust comes out of a hanging mat when beaten with a stick	Athletes take a short run before doing a long jump	Passengers standing in a bus tend to fall backwards when the bus suddenly starts moving forward	A fan continues its rotation for sometime even after it is switched off.
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12.	(a) Electrical energy is converted into light and heat energies (b) Electrical energy is converted into mechanical energy						
13.	(a) Impulse- momentum principle (b) Some applications (any two)						

	<ul style="list-style-type: none"> • During a pole vault jump, the impact is reduced by falling on foam bed • Hay or sponges are used while packing glassware, this helps to avoid breaking of glassware due to collision • Karate experts moves their hands with great speed to chop strong bricks
14.	<p>(a) Honey</p> <p>(b) Viscosity</p> <p>It is the characteristic property of a liquid to oppose the relative motion between its different layers</p>
15.	<p>(a) Momentum before collision = $m_1u_1 + m_2u_2 = (6 \times 8) + (4 \times 4) = 64 \text{ Kgm / s}$</p> <p>(b) Momentum after collision = 64 Kgm/s</p> <p>(c) Conservation of momentum</p>
16.	<p>(a) Weight of lander module on the surface of earth = $\text{mass} \times g_e = 1752 \times 10 = 17520 \text{ N}$</p> <p>(b) Weight after landing on the moon = $\text{mass} \times g_{\text{moon}} = 1752 \times 1.6 = 2803.2 \text{ N}$</p>
17.	<p>(a) An aero plane flying at certain height</p> <p>(b) Stretched bow- potential energy A wound spring – potential energy</p>
18.	<p>(a) Centripetal force, $F = \frac{mv^2}{r} = \frac{50 \times 6^2}{30} = 60 \text{ N}$</p> <p>(b) To reduce centripetal force</p> <ul style="list-style-type: none"> • Reduce speed of the body • Reduce mass of the body • Increase the radius of the circular path
19.	<p>(a) Instrument P</p> <p>(b) Instrument Q measures weight of a body. Since the body is moved to poles the acceleration due to gravity increases compare to equator so weight of the body also increases</p>
20.	<p>(a) Zero, In free fall the object cannot be able to give reaction force. Also, the gravitational force is utilized to give acceleration to the object.</p> <p>(b) Gravitational force = force of the body</p> $\frac{GMm}{R^2} = m \times a$ <p>i.e, $a = \frac{GM}{R^2}$</p>
21.	<p>(a) Potential energy is converted into kinetic energy</p> <p>(b) Kinetic energy = $\frac{1}{2}mv^2 = \frac{1}{2} \times 0.2 \times 0.25^2 = 0.00625 \text{ J} = 6.25 \times 10^{-3} \text{ J}$</p> <p>(c) Work done = change in Kinetic energy = $6.25 \times 10^{-3} \text{ J}$</p>

22. (a) Velocity at 3rd second = 6m/s and velocity at 9th second = 18 m/s

(b) Momentum of the car at 3rd second = $800 \times 6 = 4800\text{kg m/s}$

Momentum of the car at 9th second = $800 \times 18 = 14400\text{kg m/s}$

(c) Rate of change of momentum of the car = $\frac{m(v-u)}{t} = \frac{800(18-6)}{6} = \frac{800 \times 12}{6} = 1600\text{N}$

(d) Magnitude of force = rate of change of momentum = 1600N

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