ENERGY WORK and KINEMATICS TEST PHYSICS الملف
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INSTITUTO LATINOAMERICANO
COMPROMETIDOS CON LA EDUCACIÓN

PHYSICS TEST
8TH GRADE
TERM 2 PART 1

School year: 2021-2022	Date:
Name:	

I. Select the correct answer.

1. Buoyancy depends on:

   A. Density of the fluid

   B. Volume of the body

   C. Both of these

   D. None of these

2. Molten lava, oxygen, water, neon, argon, salt water are examples of:

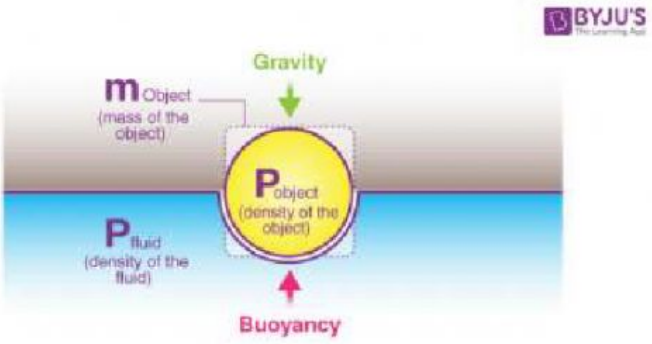
   A. Newtonian fluids

   B. Fluids

   C. Elements

   D. Molecules

3. Based on the image, which statement is correct?



   A. It represents the tendency of the fluid to be denser than the submerged object.

B. It represents the tendency of an object to float in a fluid since the upward force exerted by the fluid opposes the weight of an object immersed in a fluid.

C. It represents the force that opposes the fully immersed object and is represented as a vector pointing upward.

D. It represents the capacity of all fluids to take up the shape of its container.

4.

A $0.650\ \mathrm{kg}$ garden gnome went snorkeling a little too low and found himself at the bottom of a fresh water lake of depth $35.0\ \mathrm{m}$. The garden gnome is solid (with no holes) and takes up a total volume of $1.44 \times 10^{-3}\ \mathrm{m}^3$. The density of fresh water in the lake is $1000 \frac{\mathrm{kg}}{\mathrm{m}^3}$.

What is the buoyant force on the gnome?

$F_b = \rho V g$

A. 141.1 N

B. 14.1 N

C. 1.411 N

D. 0.1411 N

5. According to Archimedes principle, what is the up thrust of the body equal to?

A. Weight of the liquid displaced

B. Density of the liquid

C. Weight of the liquid

D. Volume of the liquid

6. Momentum depends on:

A. mass

B. velocity

C. density, mass, and velocity

D. both A and B

7. Determine the momentum of a 60-kg halfback moving eastward at 9 m/s.

   A. p = 540 kg•m/s, west

   B. p = 540 kg•m/s, east

   C. p = 6.66 kg•m/s, east

   D. p = 6.66 kg•m/s, west

8. The force times the time equals the mass times the change in velocity ($F \bullet t = m \bullet \Delta v$) is what we know mathematically as:

   A. momentum

   B. momentum in motion

   C. momentum change

   D. force applied to stop an object

9. Jennifer, who has a mass of 50.0 kg, is riding at 35.0 m/s in her red sports car when she must suddenly slam on the brakes to avoid hitting a deer crossing the road. She strikes the air bag, that brings her body to a stop in 0.500 s. What average force does the seat belt exert on her?

   A. 875 N

   B. 3500 N

   C. 0.74 N

   D. 2.85 N

10. A force acts rightward upon an object as it is displaced rightward. In such an instance, the force vector and the displacement vector are in the same direction. Thus, the angle between F and d is _____

A. 180°

B. 0°

C. 270°

D. 90°

11. A force acts leftward upon an object that is displaced rightward. In such an instance, the force vector and the displacement vector are in the opposite direction. Thus, the angle between F and d is _____

A. 180°

B. 0°

C. 270°

D. 90°

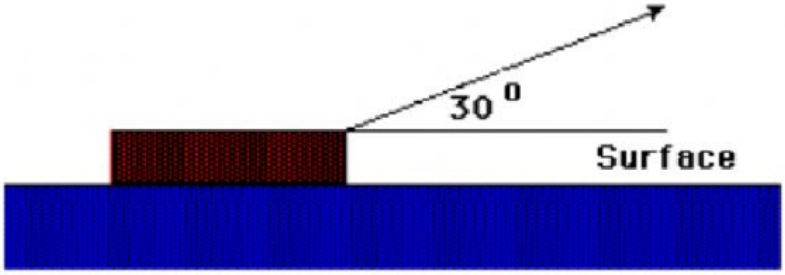
12. The _____ is the unit of work.

A. 1 J = 1 N * m/s

B. 1 J = 1 N /m

C. 1 J = 1 N * m

13. A force of 50 N acts on the block at the angle shown in the diagram. The block moves a horizontal distance of 3.0 m. How much work is done by the applied force?



A. -150 Joules

B. 150 Joules

C. 129.9 Joules

D. -129.9 Joules

14. How much force is applied to lift a block 3.0 meters vertically at a constant speed with a work of 45 Joules?

    A. 15 N
    B. -15 N
    C. 135 N
    D. -135 N

15. A student with a mass of 80.0 kg runs up three flights of stairs in 12.0 sec. The student has gone a vertical distance of 8.0 m. Determine the amount of work done by the student to elevate his body to this height. Assume that his speed is constant.

    A. 6272 Joules
    B. 640 Joules
    C. -6272 Joules
    D. -640 Joules

16. _____ is the energy stored in an object as the result of its vertical position or height.

    A. Gravitational energy
    B. Gravitational potential energy
    C. Potential energy
    D. Gravitational stored energy

17. _____ is the energy stored in elastic materials as the result of their stretching or compressing.

    A. Elastic energy
    B. Elastic stored energy
    C. Elastic potential energy
    D. Elastic released energy

18. If a spring is not stretched or compressed, then...

    A. ... there is no elastic potential energy stored in it.

B. … there is elastic potential energy stored in it.

19. A moving baseball has mechanical energy due to both its high speed. This is an example of:

A. Kinetic mechanical energy

B. Potential mechanical energy

C. Energy

D. Energy in motion

20. A barbell lifted high above a weightlifter's head possesses mechanical energy due to its vertical position above the ground. This is an example of:

A. Gravitational force

B. Gravitational potential energy

C. Gravity in form of energy

D. Gravitational kinetic energy

FORMULAS

Linear motion:

$$\mathbf{v} = \frac{\Delta \mathbf{s}}{\Delta t}$$

$$\mathbf{a} = \frac{\Delta \mathbf{v}}{\Delta t}$$

$$\mathbf{s} = \mathbf{v}_i t + \frac{1}{2}\mathbf{a}t^2$$

$$\mathbf{v}_f = \mathbf{v}_i + \mathbf{a}t$$

$$v_f^2 - v_i^2 = 2as$$

Forces:

$$\Sigma \mathbf{F} = m\mathbf{a}$$

$$F_{friction} = \mu F_{normal}$$

$$F_{spring} = -kx$$

Work and energy:

$$W = Fs\cos\theta$$

$$KE = \frac{1}{2}mv^2$$

$$PE_{gravity} = mgh$$

$$PE_{spring} = \frac{1}{2}k(\Delta x)^2$$

Momentum:

$$\mathbf{p} = m\mathbf{v}$$

$$\Delta p = F_{\text{net}}\Delta t$$

F_{net} is the net external force, Δp is change in momentum, and Δt is the time over which a net force acts

Impulse = (force)(change in time) = (mass)(change in velocity)

$$F\Delta t = m\Delta v$$

Fluids:

$$\rho = \frac{m}{V}$$

$$\text{specific gravity} = \frac{\rho}{1{,}000\ \text{kg/m}^3}$$

$$P = \frac{F}{A}$$