Hohete Tibeb Share

Ethio - Parents' Physics Test yourself for Grade 9

2019/20

Unit 5 Simple Machines

I. Write true or false.

1. A wedge is another form of an inclined plane.
2. Inclined plane can multiply distance and change direction.
3. A third order lever is force multiplier.
4. Gears can multiply energy at the same time.
5. A machine at the same time can change velocity and direction at the same time.

II. Match

Column A	**Column B**
___1. Single fixed pulley	A. spade
___2. First order lever	B. double inclined plane
___3. Second order lever	C. screw jack
___4. Third order lever	D. only change direction
___5. Wedge	E. scissors
___6. Wheel and axle	F. paper cutter
___7. Mechanical advantage	A. S G. S_E/S_L
___8. Velocity ratio	H. R/r
	I. L/E

III. Choose the Correct answer

1. Which of the following is different from the others?
   A. wedge B. wheel and axle C. screw D. inclined plane
2. Which one of the following is the purpose of a simple machine?
   A. increasing the work done B. increasing the power
   C. transferring the applied force D. changing kinetic energy
3. Among the following which one is a special kind of lever?
   A. wedge B. pulley C. screw D. inclined plane
4. The efficiency of a machine increases as the
   A. work input increases B. effort increases
   C. distance moved by effort increases D. load increases
5. Among the following which one is a third order lever?
   A. pliers B. wheelbarrow C. sea – saw D. hoe
6. If the distance moved by the load is less than the distance moved by the effort the machine is
   A. distance multiplier B. speed multiplier
   C. force multiplier D. energy multiplier

7. A load of 400 N is hanging on the pulley system shown in the figure below. If frictional force neglected, what effort is required to lift this load?



A. 1600 N B. 800 N C. 100 N D. 80 N

8. Which one of the following can help to increase the efficiency of a screw jack?
A. increasing the effort B. increasing the diameter of the shaft
C. decreasing the load D. increasing the pitch

9. Among the following simple machines which one is a speed multiplier?
A. nut cracker B. wheelbarrow C. oar in water D. ice tongs

10. A load of 500 N is lifted vertically by a single movable pulley. What effort is required to lift this load if frictional force is neglected?
A. 250 N B. 500 N C. 1000 N D. 125 N

11. Which is **not** a type of simple machine?
A. spring B. gear C. pulley D. wedge

12. If the actual mechanical advantage of a machine is 5 and the machine used to lift a load of 2000 N, what will be the force applied on the machine?
A. 150N B. 250N C. 350N D. 400N

13. Which of these is an example of a wedge?
A. skateboard B. bottle opener C. stairs D. ax

14. Which of the following is different from others?
A. Wedge B. pulley C. screw D. inclined plane

15. One of the following is an example of 2nd order lever?
A. pincers B. crowbar C. paper cutter D. crowbar

16. The velocity ratio of a single fixed pulley is always equal to
A. 1 B. 2 C. 3 D. 4

17. One of the following is different from the others
A. spade B. see -saw C. pliers D. wheelbarrow

18. A wedge has a length of 48 cm and a width of 40 cm. Find its velocity ratio.
A. 1.2 B. 0.8 C. 4 D. 22

19. In a differential pulley, the bigger pulley of two attached pulleys has a diameter of 50 cm, the smaller pulley has a diameter of 30 cm. Find the velocity ratio when a load is being lifted.
A. 28 B. 14 C. 5 D. 3.5

20. One of the following is **true** about an ideal machine
A. AMA < VR B. Wout = Win C. $\eta > 1$ D. there is wastage

21. At one end of a lever an effort of 400 N lifts a load of 1440 N which is round at the other end of the lever. If the effort arm is 180 cm, how long is the load arm? Take the efficiency 100 %.

A. 45 cm B. 35 cm C. 25 cm D. 20 cm

22. If the mechanical advantage of a machine is less than one then the machine is said

A. force multiplier B. speed multiplier
C. direction changer D. energy multiplier

23. Among the following which one is **not** a complex machine?

A. wheelbarrow B. chain hoist C. bottle opener D. scissors

24. Which one of the following is **not** affected by friction?

A. work input B. distance moved C. effort D. power input

II. Fill in the blanks with an appropriate word or phrase.

1. The force applied on a machine is _____.
2. The ratio of distance moved by effort to distance moved by load is _____.
3. The velocity ratio of a chain hoist is given by_____.
4. The measure of the performance of a machine is_____
5. A cylindrical material with a helical thread around it is_____
6. The ratio of work output to the work input is_____
7. A _____ is something that makes work better, easier, or faster

III. Work out the following problems and show all the necessary steps as clearly as possible.

1. What is the velocity ratio of an inclined plane of slope length 80 m and that raises to a height of 20 m?
2. The radii of the wheel and the axle are 20 cm and 4 cm respectively, if an effort of 10 N is applied to raise a load of 30 N, what is the efficiency of the wheel and axle?
3. A machine has an efficiency of 80 %. When the effort moves a distance of 3 m, the machine moves a load a distance of 75 cm. Find the effort needed to move a load of 195 N with this machine.
4. A system of pulleys is used to raise a load of 12800 N when an effort of 1600 N moves through 40 m the load raises through 4 m. What is the efficiency of the pulley system?
5. A block of weight 8000 N is pushed up a slope by a force of 400 N. What is the mechanical advantage of the machine?

Hohete Tibeb Share

Ethio - Parents' Physics Test yourself for Grade 9

2019/20

Unit 6 Fluid Mechanics

I. Write True or False.

1. Pressure is the parallel force acting on a certain area of the surface.
2. Pressure in fluid is independent on the depth of the fluid.
3. Buoyant force is independent on the volume of the fluid.
4. Atmospheric pressure decreases as altitude increases.
5. The up thrust on the body is greater that the weight of the liquid displaced.

II. Match column A with Column B

Column A	Column B
____1. Pressure	A. used to measure pressure of a gas
____2. Atmosphere	B. atmospheric pressure
____3. Bourdon gauge	C. the layer of air
____4. Barometer	D. gases
____5. Fluid	E. Pascal
	F. solid and liquid

I. Choose the correct answer

1. Which one of the following is a unit less physical quantity?
   A. buoyant force
   B. density
   C. specific gravity
   D. work input

2. When you are in a swimming pool what can you say about the total pressure on you? It is equal to
   A. the atmospheric pressure
   B. the sum of the atmospheric pressure and the fluid pressure
   C. the difference of the atmospheric pressure and the fluid pressure
   D. the difference of the fluid pressure and the atmospheric pressure

3. Which one of the following is the application of pressure in fluids?
   A. suction pad
   B. drinking straw
   C. hydraulic press
   D. siphon

4. Which pair of forces are equivalent?
   A. apparent weight and weight
   B. apparent weight and buoyant force
   C. weight and up thrust
   D. up thrust and buoyant force

5. In which one of the following condition a body immersed in a liquid sinks?
   A. when the weight is greater than the buoyant force
   B. when the weight equals to the buoyant force
   C. when the buoyant force is greater than the weight
   D. when the density of the body is less than the density of the liquid

6. The pressure inside a liquid is independent of
   A. depth B. acceleration due to gravity
   C. the base area of the container D. the density of the liquid

7. A device that is used to remove a liquid from a petrol tank is
   A. vacuum pump B. siphon
   C. suction pad D. lift pump

8. Which one of the following is **true** about gases?
   A. they cannot change their shape
   B. their particles are closer together
   C. there is no bonding between the particles
   D. they are not compressible

9. In a simple hydraulic, a force of 200 N is applied on the smaller piston of diameter 10 cm^2. What weight is supported on the larger piston of diameter 80 cm^2?
   A. 400 N B. 800 N C. 1200 N D. 1600 N

10. A body has a weight of 23 N and an apparent weight of 11 N. What is the buoyant force on the body?
   A. 34 N B. 12 N C. 17 N D. 11 N

11. A large aluminum ship float in water because the
   A. volume of the water has the same weight as the ship
   B. density of water is greater than the density of the ship
   C. density of water is equal to the density of the ship
   D. buoyant force is less than the weight of the ship

12. A body has a weight of 20 N in air and 15 N when completely immersed in water.
   What is the density of the body?
   A.1.33 g/cm^3 B. 0.75 g/cm^3 C. 4 g/cm^3 D.0.25 g/cm^3

13. Which one of the following is **true** about gauge pressure? It is the
   A. difference between absolute pressure and atmospheric pressure
   B. difference between weight and apparent weight
   C. sum of absolute pressure and atmospheric pressure
   D. sum of the apparent pressure and real pressure

14. The law of floatation works by the principle of
   A. Pascal's B. Bernoulli's C. Archimedes' D. Huygens'

15. Atmospheric pressure is depend on

A. density of solid B. altitude C. density of liquid D. volume of the liquid

16. The specific gravity of a solid is 4. What is the volume of a 16 kg solid? (ρ = 1 g/cm^3)

A. 400 m^3 B. 0.004 m^3 C. 40 m^3 D. 4 cm^3

17. A toy submarine has a weight of 8.7 N in air. When immersed in water it has a weight of 5.1 N. what will be the weight of water displaced?

A. 1.6N B. 3.6N C. 4.6N D. 6.2N

18. The ratio of the area of the larger piston to the smaller piston in a hydraulic lift is 10. If the force on the smaller piston is 40 N, how much load we can lift using it?

A. 3000 N B. 400 N C. 1585 N D. 1875 N

19. What is the relative density of mercury of density 11600 kg/m^3? The density of water is 1000 kg/m^3.

A. 11600 B. 116 C. 11.6 D. 1.16

20. What will be the density of a floating block that has a volume of 0.6 m^3 and displaces 0.3 m^3 of water? The density of water is 1000 kg/m^3.

A. 1000 kg/m^3 B. 1333 kg/m^3 C. 750 kg/m^3 D. 500 kg/m^3

21. Which one of the following determine pressure in liquids?

A. depth B. base area of the container

C. base area of the liquid D. weight of the liquid

22. A metal cube of density 2500 kg/m^3 has an edge length of 20 cm. What is the mass of the metal?

A. 1.7 kg B. 2.7 kg C. 20 kg D. 2.07 kg

23. A child's bathtub toy has a density of 0.80 g/cm^3. What fraction of the toy floats above the water?

A. 5 % B. 15 % C. 85 % D. 15 %

24. If you stand on one foot on the floor of your class room, what can you say about the pressure you exert on the floor?

A. increases B. decreases C. remained the same D. it will be halved

IV. Fill in the blanks with an appropriate word or phrase.

1. Atmospheric pressure does not depend on _____
2. The unit of specific gravity is _____
3. Example of the application of atmospheric pressure is_____
4. 1 atmospheric pressure is _____ of Hg.
5. When altitude increases atmospheric pressure _____

III. Work out the following problems and show all the necessary steps as clearly as possible.

1. A force of 80 N is acting perpendicularly on an area of 5 m^2. What is the pressure exerted on that surface?
2. What the pressure due to a liquid of column 90 cm? (Density of liquid = 1000 kg/m^3)
3. An open cylinder of base area 0.5 m^2 is filled with water to a height of 60 cm. (ρ = 1 g/cm^3, g = 10 m/s^2)
   a. Find the pressure at the bottom of the cylinder.
   b. What force is exerted on the bottom of the cylinder?
4. A barometer reads 740 mm of Hg. Calculate the pressure reading in Pa.
   (ρ = 13.6 g/cm^3, g = 10 m/s^2)

5. A wooden block of mass 4 kg has a dimension 10 cm, by 5 cm, by 20 cm. Compute the greatest and the least pressures exerted by the block.
6. A car of mass 5000 kg rests on a floor. If the area of contact between its tires and the floor is 40 cm^2, then what is the pressure it exerts on the floor?
7. A body has a weight of 12 N in air and 8 N in water. What is the density of the body?
8. A mass of 20 kg rests on an area of 5 cm^2. What is the pressure exerted by the body on the surface?