S.2 PHYSICS | REVISION QUESTIONS

TOPIC: Pressure

Attempt the Questions and submit Work for Marking on the eLearning Platform **Q &A Forum** or to Mr. Ssendawula (WhatsApp : 0700 37

1. What is 730 mm Hg in Nm^{-2} ?

A. $\frac{13600\times1000\times10}{730}$ **C.** $\frac{13600\times730}{1000\times10}$

B. $\frac{13600\times730\times10}{1000}$ **D.** $\frac{13600\times10}{1000\times730}$

2. In a hydraulic machine

A. an object displaces its own weight of fluid.

B. the press transmitted in a fluid is the same in all directions.

C. the volume of fluid compressed is proportional to the applied force

D. an object experiences an upthrust equal to the weight of fluid displaced.

3. A rectangular block of metal weighs 3 N and measures (2 x 3 x 4) cm^3.Who is the greatest pressure it can exert on a horizontal surface?

A. $5.0 \times 10^3\ Nm^{-2}$ **C.** $2.5 \times 10^3\ Nm^{-2}$

B. $3.75 \times 10^3\ Nm^{-2}$ **D.** $7.5 \times 10^{-1}Nm^{-2}$

4. In a liquid, pressure is

A. transmitted in a specific direction. **C.** decreased with depth.

B. transmitted in all directions. **D.** decreased with density.

5.A solid, Q, sinks deeper in liquid, N, than in liquid, M because the

A. upthrust on the solid is greater in liquid N than in M.

B. density of liquid M is greater than that of N.

C. density of liquid N is greater than that of M.

D. surface tension of liquid N is less than that of M.

6.Which one of the following statements is false? The pressure in a liquid

A. at any one point in a liquid would not change even when more liquid is added.

B. at anyone point depends only on the depth and density.

C. at anyone point acts equally in all directions.

D. increases with depth.

7. Pressure in a liquid is independent of the;

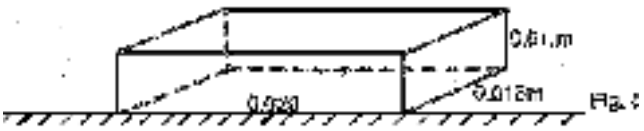
A. density of the liquid.

B. depth below the surface of the liquid.

C. pressure exerted on the surface of the liquid above.

D. cross sectional area and the shape of the vessel containing the liquid.

8. A box is placed on top of a table as shown in Figure 5, with the dimensions indicated.



If its mass is 40 kg, find the pressure it exerts on the table.

A.	$\frac{40}{0.020 \times 0.015}$	**C.**	$\frac{40 \times 10}{0.020 \times 0.015}$
B.	$\frac{40}{0.015 \times 0.010}$	**D.**	$\frac{40 \times 10}{0.020 \times 0.010}$

9. A rectangular block of dimension 4 cm × 2 cm × 1 cm exerts a maximum pressure of 200 N $m^{-2}$when resting on a table. Calculate the mass of the block.

A. 4 g.

C. 40 g.

B. 16 g.

D. 400 g.

10. A tight bottle top becomes easier to unscrew when hot water f1ows over it because the

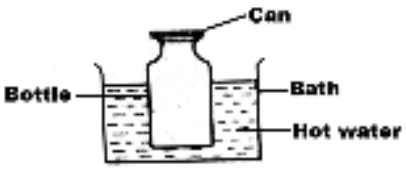
A. cap expands more than the glass.

B. glass in the neck of the bottle contracts.

C. hot water acts like oil between the glass and bottle.

D. increased pressure of the air in the bottle causes the cap to expand.

11. An empty bottle is immersed in a hot bath and then closed with a coin as shown below.



The bottle is then immersed in a cold water bath and turned upside down. The coin .....

A. does not fall off because the pressure inside the bottle is greater than that outside the bottle.

B. does not fall off because the pressure outside the bottle is greater than that inside the bottle.

C. will fall off because the pressure inside the bottle is equal to that outside the bottle.

D. will fall off because the pressure inside the bottle is greater than that outside the bottle.

12. Calculate the increase in pressure which a diver experiences when he descends in sea water of density 1.2×10^{3} kg m^{-3}.

1. 3.0×10^{2} N m^{-2}.

2. 1.2×10^{4} N m^{-2}.

3. 3.6×10^{4} N m^{-2}.

4. 3.6×10^{5} N m^{-2}.

13.The diagram in figure 3 shows a mercury barometer.

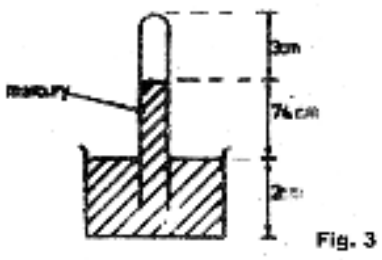


Fig. 3

14. In a hydraulic press, the area of the piston on which the effort is applied is made smaller in order to

A. facilitate the movement of the piston downwards.

B. transmit a force as large as possible to the load.

C. transmit pressure equally throughout the liquid.

D. obtain a pressure as large as possible.

15. A force of 50 N moves an object through a distance of 200 m in 40 s. Find the power expended.

A. 100 W

B. 160 W

C. 200 W

D. 250 W

16. A cork held under water rises to the surface when released because the upthrust on it is

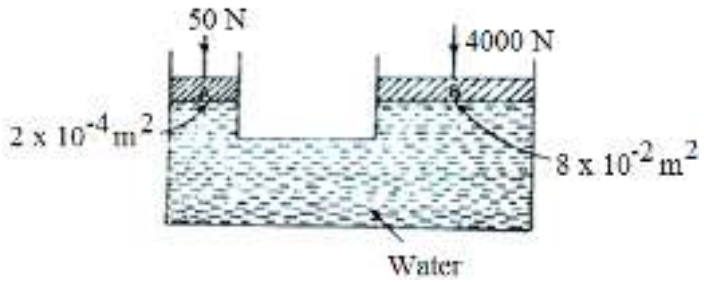
A. greater than the weight.

B. less than the weight.

C. equal to the weight.

D. equal to the weight of water displaced.

17. Forces of 50N and 400N are applied to pistons A and B respectively as shown below.



The areas of cross-section of A and B are 2×10^{-4} m^2 and

$8 \times 10^{-2} m^2$ respectively. Which of the following is not true?

A. Both pistons A and B remain at the same level

B. The upthrust on piston B is equal to 20000N

C . The pressure exerted on the water by piston B is $5x10^4 Nm^{-2}$

D. Piston B is going to move upwards

18. A mass of 2.4 kg rests on the floor. If the area of contact with the floor is 6 cm^2, what pressure does the mass exert on the floor?

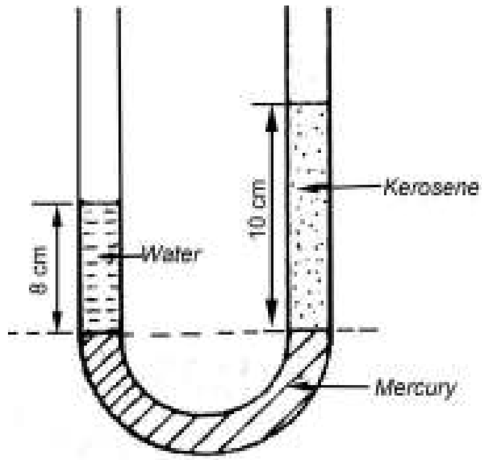
A. 0.4 N m^{-2}

B. 4.0 N m^{-2}.

C. 4.0×10^3 N m^{-2}

D. 4.0×10^4 N m^{-2}

19. An open U-tube contains columns of water and kerosene over mercury as shown in figure 1.



20. A hippopotamus can easily walk on mud without sinking while a goat will sink because

A. a hippopotamus has more weight than a goat

B. the centre of gravity of a hippopotamus is lower than that of a goat

C. a hippopotamus exerts more pressure on the ground than a goat

D. a hippopotamus exerts less pressure on the ground than a goat

21. The following are factors affecting pressure in fluids except;

A. depth below the surface of the fluid.

B. density of the liquid.

C. pressure exerted on the liquid surface.

D. surface area of the liquid.

22. When the handle, H, of the force pump shown in figure 6 is moved upwards, the valves at

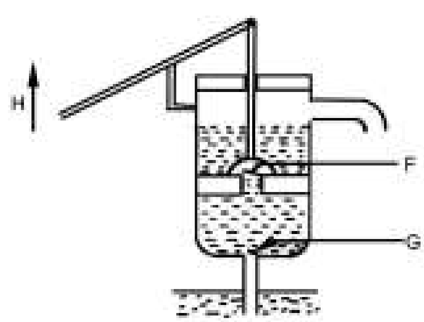


Fig. 6

A. F and G will both close.
B. F and G will both open
C. F will close and G will open.
D. F will open and G will close.

23.

20cm

If the piston in Figure above is moved down by 8cm, what is the new pressure?

A. (100-8)Pa
B. 100Pa
C. $(\frac{100x20}{12})$ Pa
D. $(\frac{12x100}{20})$Pa

24. A boy of mass 40kg balances evenly on two stilts each having an area of $8cm^2$ in contact with the ground. The pressure exerted by one stilt is;

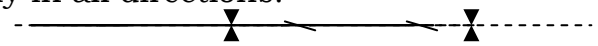
A. 50 Ncm^{-2}
B. 40 Ncm^{-2}
C. 25 Ncm^{-2}
D. 5 Ncm^{-2}

25. A hot air balloon rises in air because;
A. weight of balloon equals to weight of displaced air.
B. weight of balloon is less than weight of displaced air.
C. weight of balloon is greater than weight of displaced air.
D. weight of balloon is zero.

26. A school nurse applies a force of 30N to a syringe .Given that the cross sectional area of the tip of the needle is $1.0 \times 10^{-7} m^2$. Calculate the pressure produced at the tip of the needle.
A. 3.0×10^7 Pa
B. 3.0×10^8 Pa
C. 4.0×10^7 Pa
D. 2.5×10^8 Pa

27.Which of the following statements is NOT true about pressure in liquids?

A. It increases with depth
B. It is lowest at the surface
C. It is the same throughout the liquid
D. It acts equally in all directions.

27. 

In the figure 3 above, a fixed mass of dry gas is trapped in bulb M. Determine the total pressure of the gas in M, given that the atmospheric pressure is 760mm of mercury.

A) 114cm Hg B) 106cm Hg

C) 30cm Hg D) 46cm Hg

28. In the crushing can experiment, the can collapses because

A. It is weakened by the hot water
B. Pressure outside is greater than pressure inside
C. Pressure inside is greater than pressure outside
D. Pressure inside is atmospheric.

29.An air craft is able to experience a lift in air because,

(i) It can adjust the shape of the wings to create less pressure above the wings.
(ii) It can adjust the shape of the wings to create less pressure below the wings.
(iii) It can adjust the shape of its wings to reduce its apparent weight in air.

A. (i) only B. (ii) only C. (i) and (iii) only D. (ii) and (iii) only

ESSAY

1. (a) State Archimedes principle. (1 mark)

(b) A body weighs 100N in air, appears to weigh 50N in a liquid and 70N in water.
What is the density of the liquid. (3 marks)2

2. (a) State two factors affecting pressure of a liquid. (1 mark)

(b) (i) Name the instrument used to measure atmospheric pressure. (1 mark)

(ii) The value of atmospheric pressure of a certain place was recorded as 76 cmHg. Express this value in S.I units. (density of mercury = $1.36 \times 10^4 kgm^{-3}$) (2 marks)

3. (a) Explain each of the following observations:

(i) An inflated bicycle tube may burst when left in a hot piece.
(ii) Large water reservoirs are much wider at the base than at the top.

(b) Figure 3 shows the structure of a force pump.

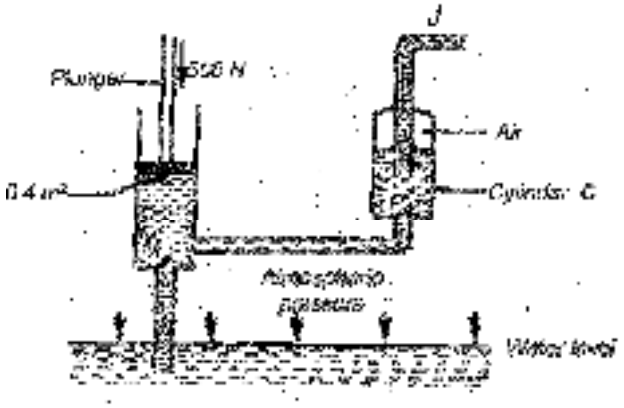


Fig. 3

(i) Describe the action of the pump.
(ii) If a downward force of 500 N is exerted on the plunger whose surf area is 0.4 m^2, calculate the pressure which forces water into cylinder.

4. The difference between the atmospheric pressure at the top and bottom of a mountain is 1×10^{4} N ms^{-2}. If the density of air is 1.25 kg^{-3}, calculate the height of the mountain.

5. In figure one, piston A has diameter of 14 cm while B has diameter 280 cm. If a force of 77N is exerted on piston A, calculate the force exerted by piston B.

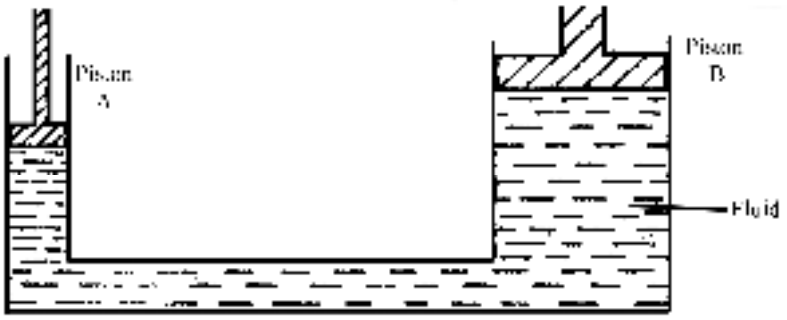


Fig. 1