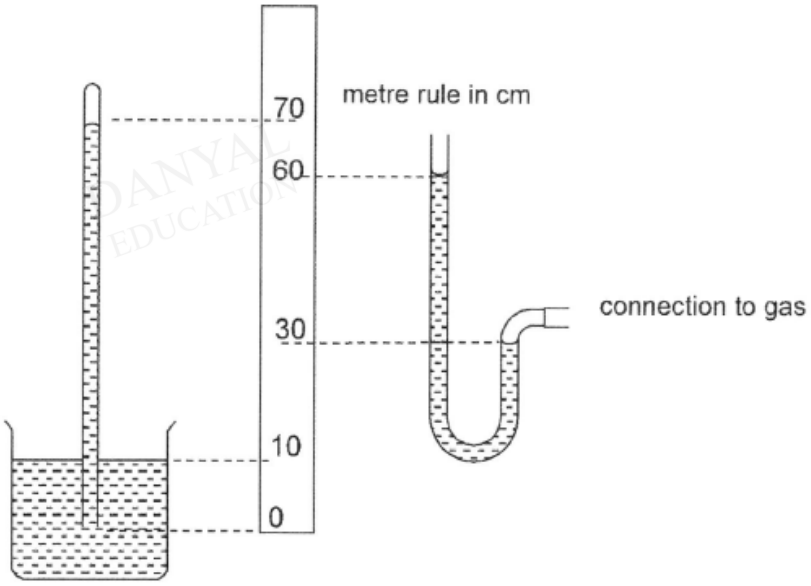
O Level Pure Physics MCQs

Pressure Test 1.0

Q1

A mercury barometer and a mercury manometer are placed in the same room which is on a hill top. The manometer is connected to a gas container.

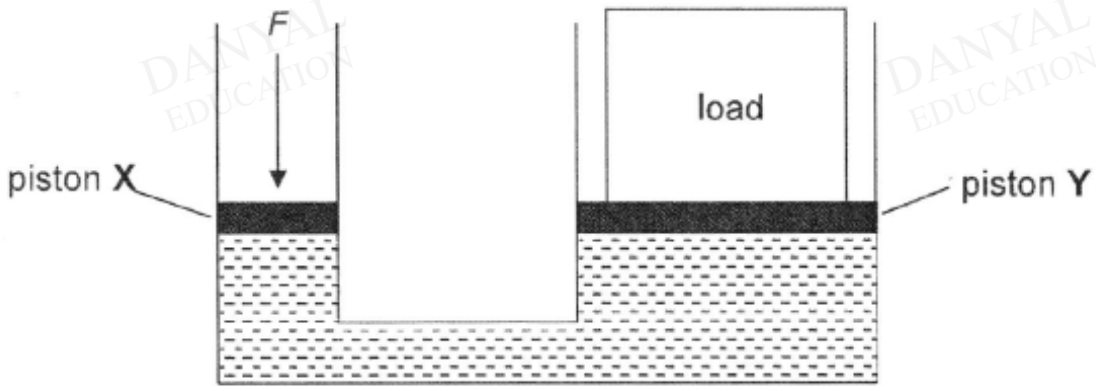


What is the pressure of the gas?

A 15 cm Hg **B** 40 cm Hg **C** 75 cm Hg **D** 90 cm Hg

Q2

A hydraulic press which consists of two circular pistons is shown. The diameter of piston **Y** is twice the diameter of piston **X**. A downward force of *F* is applied to piston **X**.



What is the size of the upward force on the load?

A 0.5*F* **B** 1.0*F* **C** 2.0*F* **D** 4.0*F*

Q3

Fig. 11.1 shows a simple hydraulic jack. Which of the following alterations will enable heavier loads to be lifted?

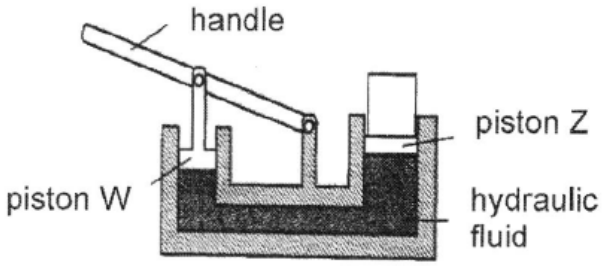


Fig. 11.1

(i) decrease the cross-sectional area of piston W
(ii) increase the cross-sectional area of piston Z
(iii) use a denser hydraulic fluid

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

Q4

Fig. 12.1 shows a U-tube containing oil and water. The density of water is 1.0 g/cm^3.

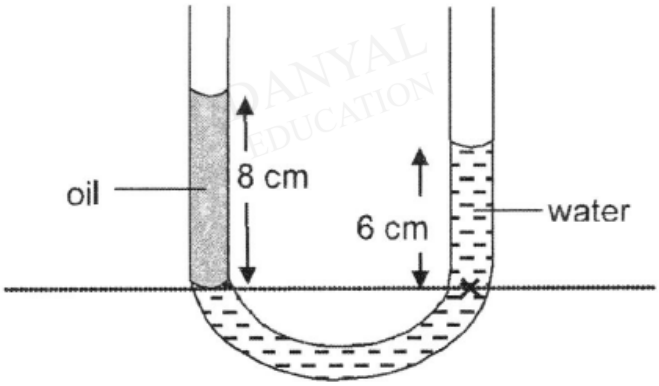


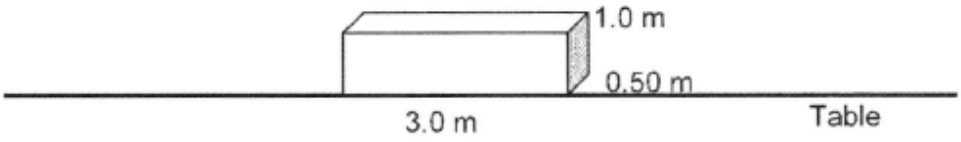
Fig. 12.1

What is the density of the oil?

A 0.25 g/cm^3 **B** 0.50 g/cm^3 **C** 0.75 g/cm^3 **D** 0.90 g/cm^3

Q5

An object of mass 4.0 kg with a length of 3.0 m, width of 0.50 m and height of 1.0 m is placed on a table as shown in the diagram below.



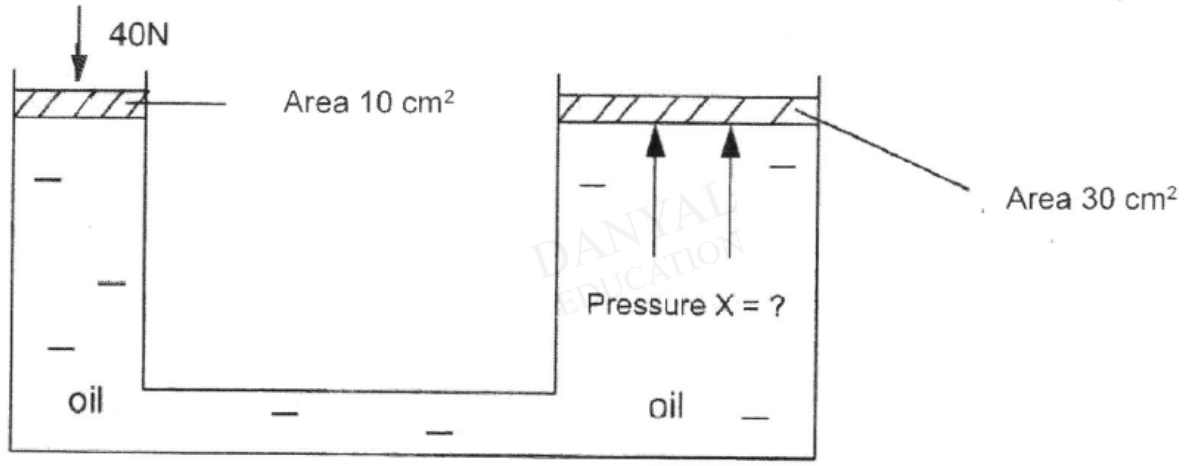
What is the pressure exerted by this object on the table?

A 0.33 Pa **B** 2.7 Pa

C 1.3 Pa **D** 27 Pa

Q6

The diagram shows a force of 40 N acting on the 10 cm^2 small piston of a hydraulic jack.

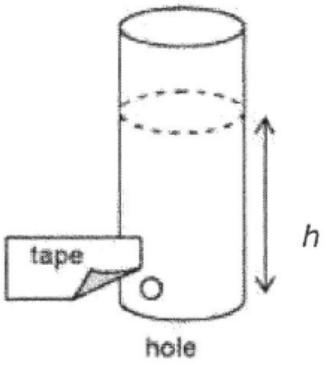


What is the pressure X on the larger piston?

A 1.33 N/cm^2 **B** 4 N/cm^2 **C** 12 N/cm^2 **D** 120 N/cm^2

Q7

Water of density 1000 kg/m^3 fills up to height *h* in a container. There is a hole at the base of the container and water starts to flow out from the hole of area 2.0 mm^2. The minimum force that the tape must withstand is 0.0040 N. Atmospheric pressure is 10^5 Pa.

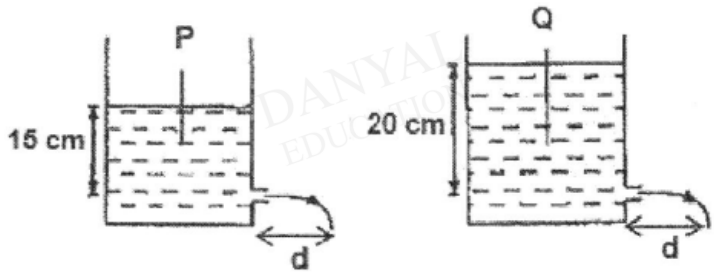


What is height *h*?

A 10 cm **B** 20 cm **C** 100 cm **D** 200 cm

Q8

The diagram below shows two identical containers containing liquid **P** and liquid **Q**.



Water spurts out to the same horizontal distance **d** when the depth of liquid **P** is 15 cm and the depth of liquid **Q** is 20 cm.

The density of liquid **P** is 2.00 g/cm^3.

What is the density of liquid **Q** in g/cm^3?

A 0.67
B 1.30
C 1.50
D 2.70

Q9

The diagram on the right shows a mercury barometer. Some liquid less dense than mercury exists above the mercury column.

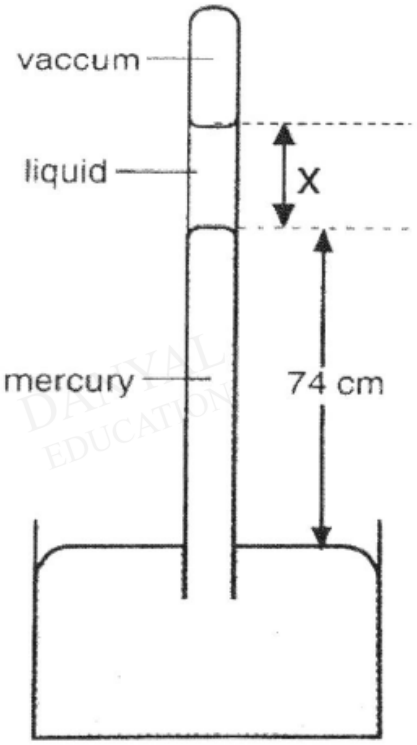
This liquid does not mix with mercury.

Given that:

atmospheric pressure = 76 cmHg
density of liquid = 1200 kg/m^3
density of mercury = 13600 kg/m^3

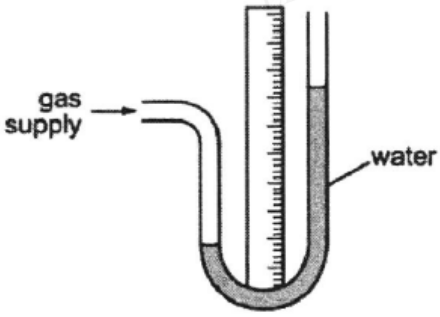
What is the height **X** of the liquid column?

A 2.0 cm
B 22.7 cm
C 26.0 cm
D 76.0 cm

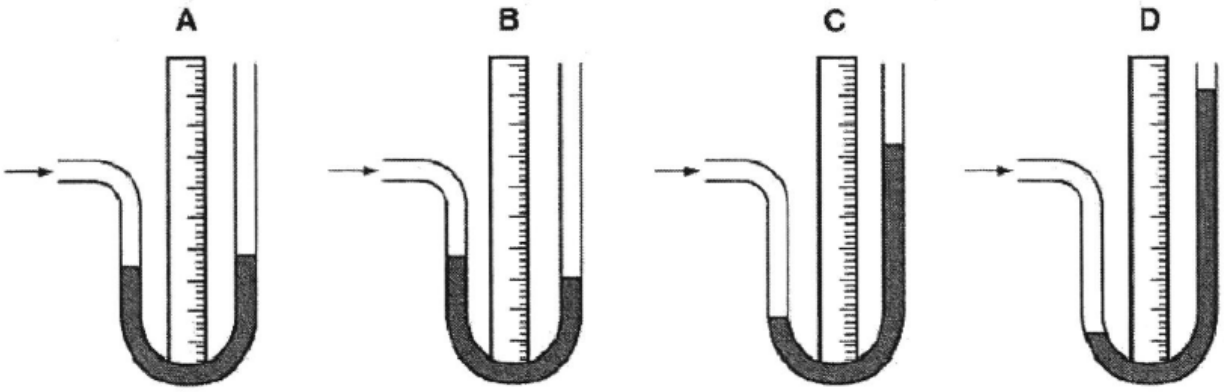


Q10

The diagram below shows a water manometer connected to a gas supply.



The water in the manometer is then replaced by cooking oil, which is less dense than water. Which diagram shows the cooking oil levels when the manometer is connected to the same gas supply?



Answers

Pressure Test 1.0

Q1 D

Q2 D

Q3 A

Q4 C

Q5 D

Q6 B

Q7 B

Q8 C

Q9 B

Q10 D