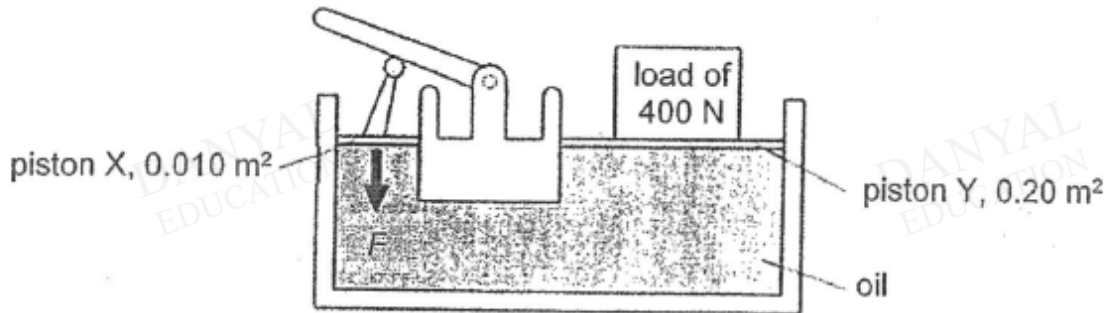## O Level Combined Physics MCQs

Pressure Test 1.0

Q1

The hydraulic system shown in the diagram below contains oil. A downward force F is applied at piston X to support the load of 400 N placed at piston Y.
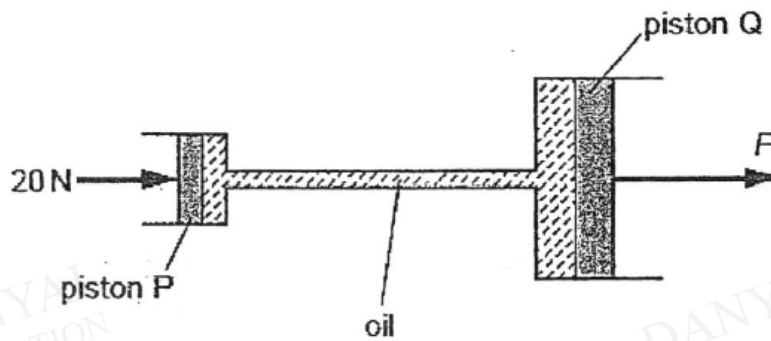

Which is the magnitude of force F?

A   0.80 N   B   20 N

C   400 N   D   8 000 N

Q2

The diagram shows a simple model of the braking system of a car. A force of 20 N is applied to piston P. As a result, there is a force F acting on piston Q.

Piston P has an area of 5.0 cm² and piston Q has an area of 25 cm².

What is the force F?

A   4.0 N   B   20 N   C   100 N   D   500 N

Q3

A block with dimensions 1.6 m x 1.0 m x 0.5 m exerts a maximum pressure of 8 kPa on the floor.

What is the weight of the object?

| A 4000 N	B 6400 N	C 12800 N	D 16000 N

Q4

An Eskimo of mass 50 kg stands on snow, wearing snow-shoes. The area of each snow-shoe in contact with snow is 0.2 m². Given that the gravitational field strength is 10 N/kg, what is the pressure exerted on the snow by the Eskimo?

A 25 N/m²	B 125 N/m²	C 200 N/m²	D 1250 N/m²

Q5

A block 2.5 m long, 1.0 m wide and 1.5 m high rests on the ground as shown.
The gravitational field strength is 10 N/kg.

1.5 m

1.0 m

2.5 m
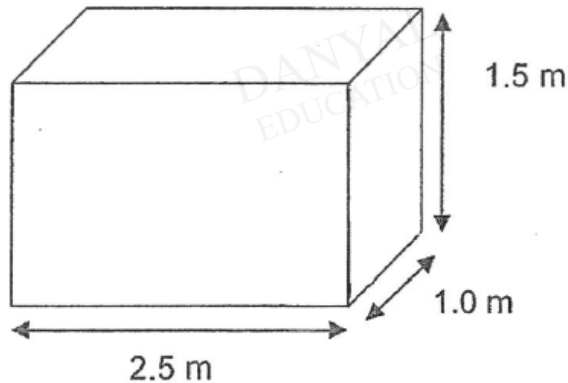
Given that the block has a mass of 120 kg, what is the largest possible pressure the block can exert on the ground?

A 48 Pa	C 320 Pa
B 80 Pa	D 800 Pa

Q6

In a hydraulic press as shown, the small piston of 100 N is pushed down and this is just sufficient to raise a heavy load in the large piston. Neglecting the weight of the pistons, what is the maximum load that can be lifted?
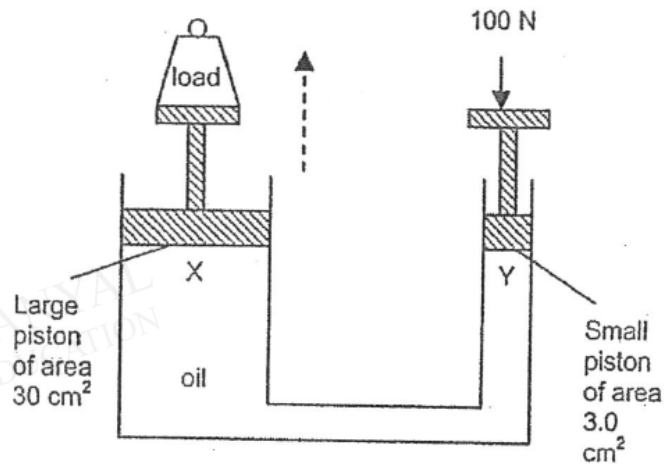
A   10 N

B   1000 N

C   100 N
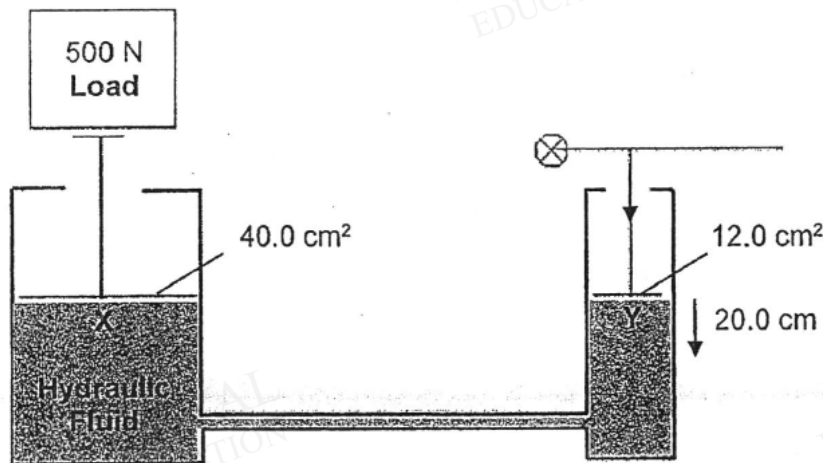
D   10 000 N

Q7

Fig. 5.1 shows a hydraulic system.

Fig. 5.1

Piston **X** of the hydraulics system is used to lift a 500 N load up at constant speed by pushing piston **Y** 20.0 cm downward.

The cross sectional area of pistons **X** and **Y** are 40.0 cm² and 12.0 cm² respectively.
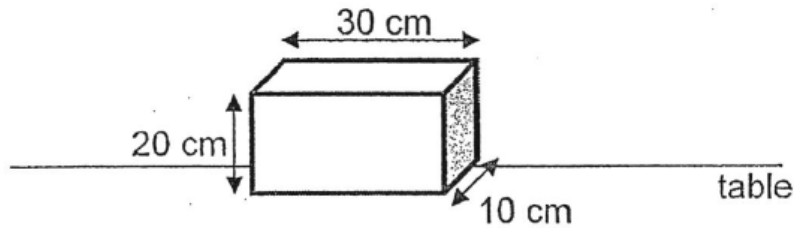
The pressure in the hydraulic fluid remains the same throughout the motion.

Calculate the push force at piston **Y**.

A   150 N   B   250 N   C   1000 N   D   1670 N

3

Q8

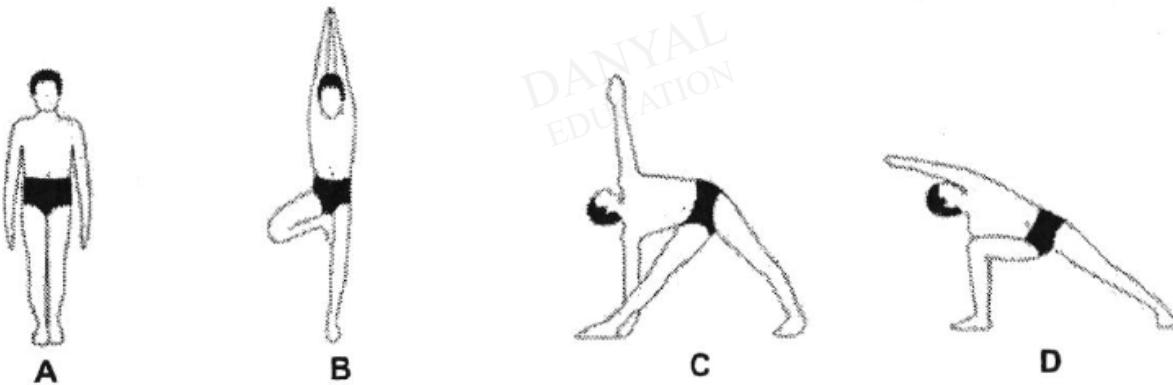A 500 N block is placed on the table in the position shown.

What is the pressure which the block exerts on the table?

A. 0.08 N/cm²
B. 0.83 N/cm²
C. 1.67 N/cm²
D. 2.50 N/cm²

Q9

Which of the following positions will bring about the largest pressure exerted on the ground?

Q10

To prevent large trucks from sinking into the ground at a construction site, large wooden boards are placed on the ground for the trucks to go over.

How does this prevent the trucks from sinking?

A   The boards increase the surface area of the ground.

B   The boards increase the contact area between the trucks and the ground.

C   The boards decrease the force acting the ground.

D   The boards are harder than the ground.

4

Answers

Pressure Test 1.0

Q1 B

Q2 C

Q3 A

Q4 D

Q5 D

Q6 B

Q7 A

Q8 C

Q9 B

Q10 B