Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic :15_Forces and their matter

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

Figure 17 shows a crane lifting a concrete block from the bottom of a deep pool of water.
The top of the block is a distance, *h*, below the surface of the water.

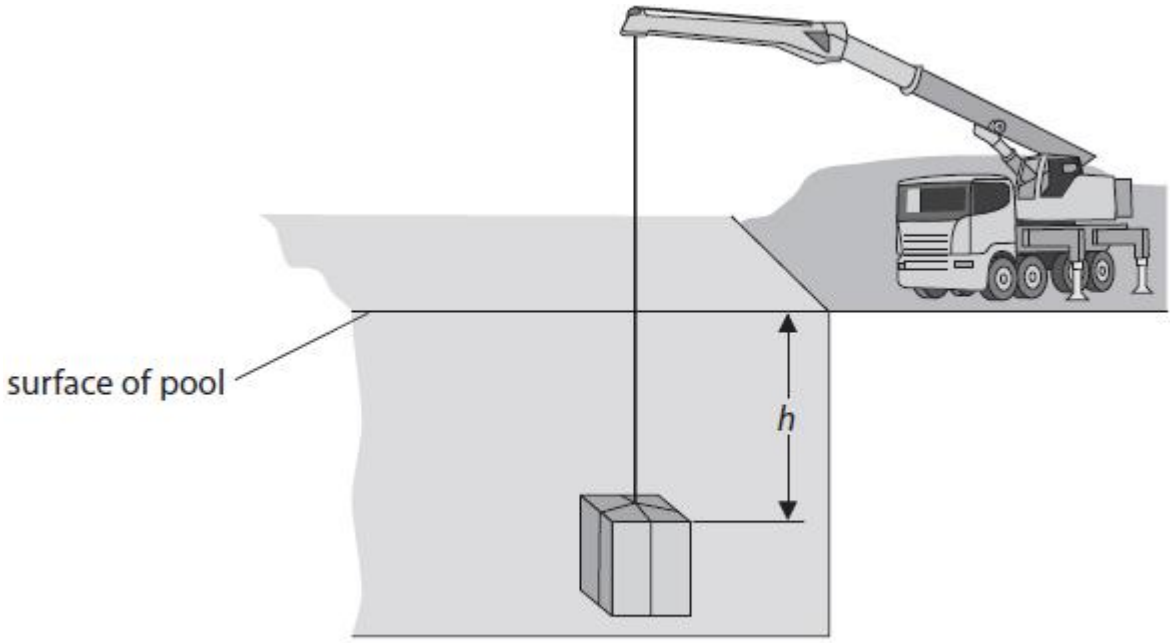

Figure 17

The force on the top of the block due to the water above it is 41 000 N.

The pressure due to the water on the top surface of the block is 66 000 Pa.

(i) Calculate the area of the top surface of the block.

(2)

area of the top surface of the block = ... m^2

(ii) The density of water is 1000 kg/m^3.

Calculate the distance, *h*, between the top of the block and the surface of the water.
Gravitational field strength, *g*, is 10 N/kg.
Use an equation selected from the list of equations at the end of this paper.

(2)

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h = ... m

(iii) Explain why there is an upthrust produced by the water on the block.

(2)

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* (iv) The crane raises the block until it is high enough out of the water to be loaded on to a lorry.
The block moves upwards at a constant speed even though the lifting force in the cable changes.
Figure 18 shows the graph of how the lifting force changes while the block is being raised.

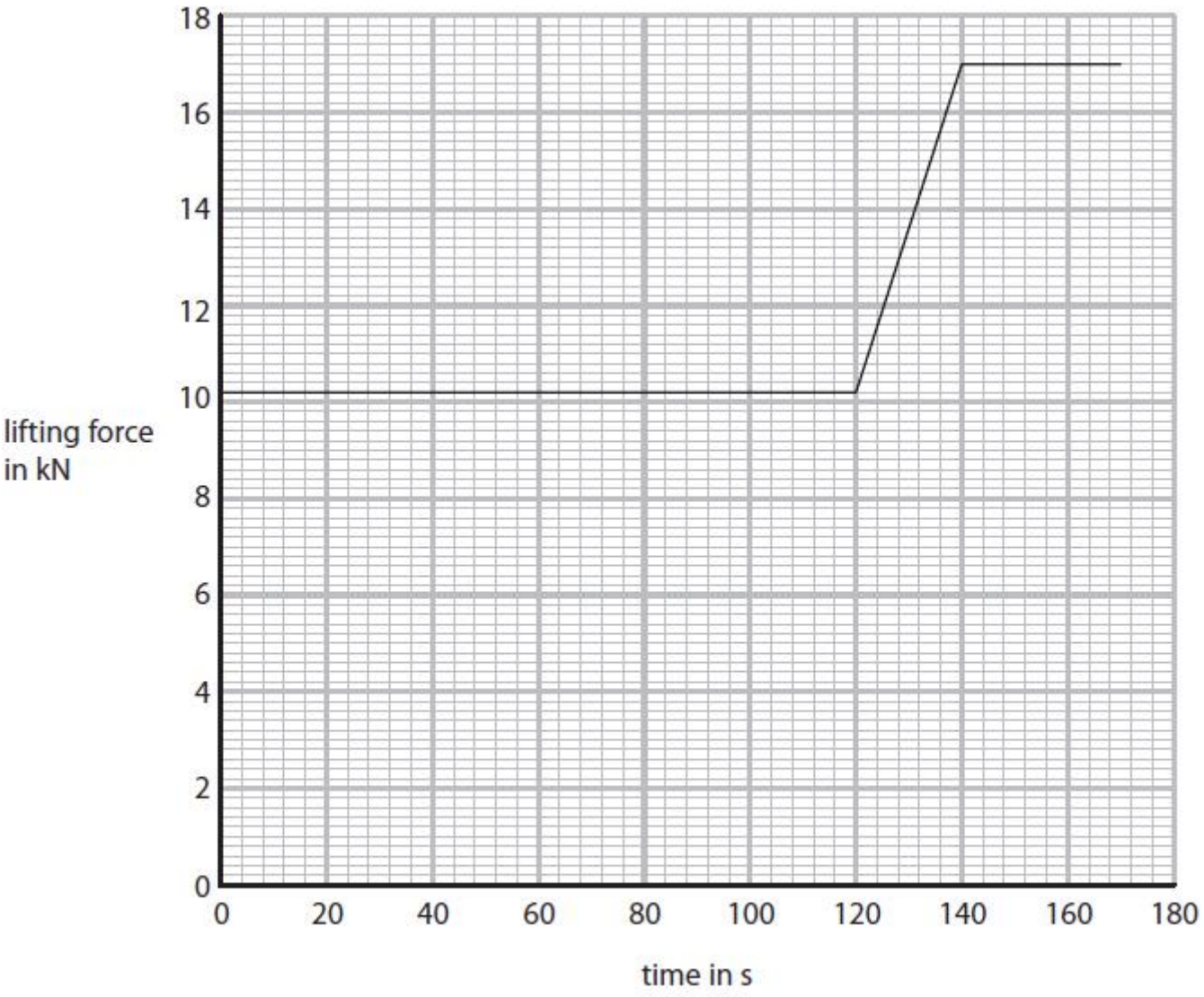

Figure 18

Explain why the lifting force changes as shown on the graph in Figure 18.
Include calculation(s) in your answer.

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(6)

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(Total for question = 12 marks)

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Q2.

Figure 8 shows some water in a tank.

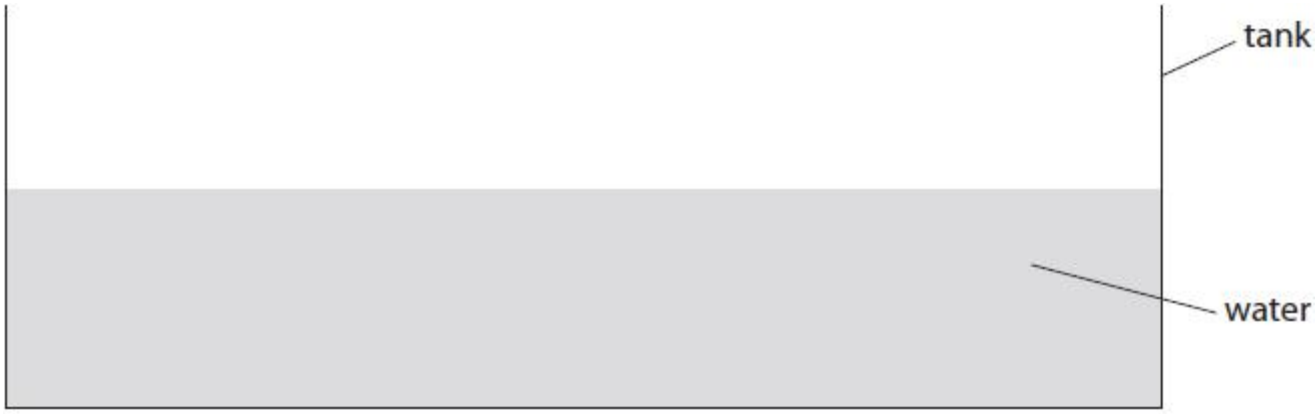

Figure 8

(i) The bottom of the tank has an area of 0.80 m^2.

The force on the bottom of the tank, due to the water, is 2400 N.
Calculate the pressure, due to the water, on the bottom of the tank.

(3)

pressure = ... Pa

(ii) More water is added to the tank.

Explain how the pressure on the bottom of the tank changes when more water is added to the tank.

(2)

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(iii) Figure 9 shows an object on the bottom of the tank of water.

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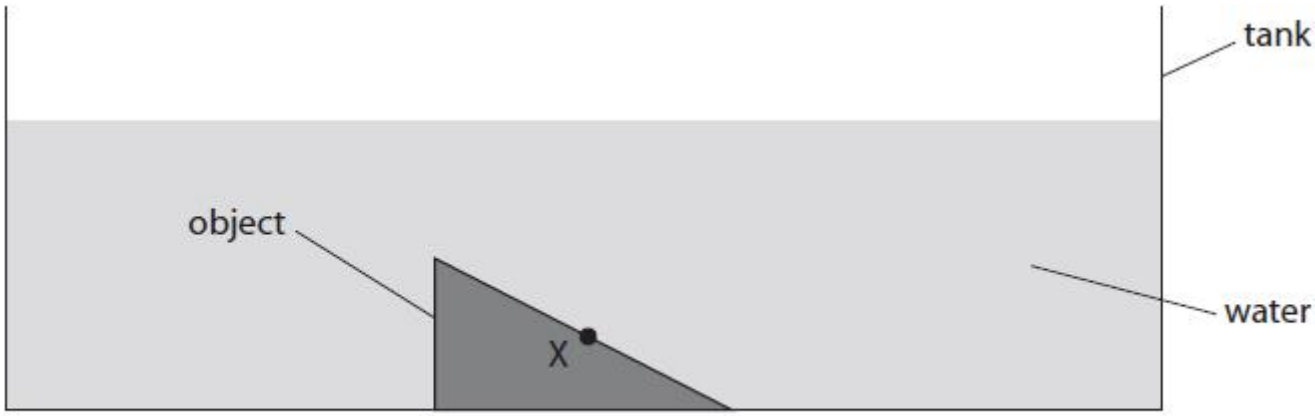

Figure 9

Draw an arrow on Figure 9 to show the direction of the force exerted by the water on the surface of the object at point X.

(1)

(Total for question = 6 marks)

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