Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

Figure 23 shows some water in a tank.

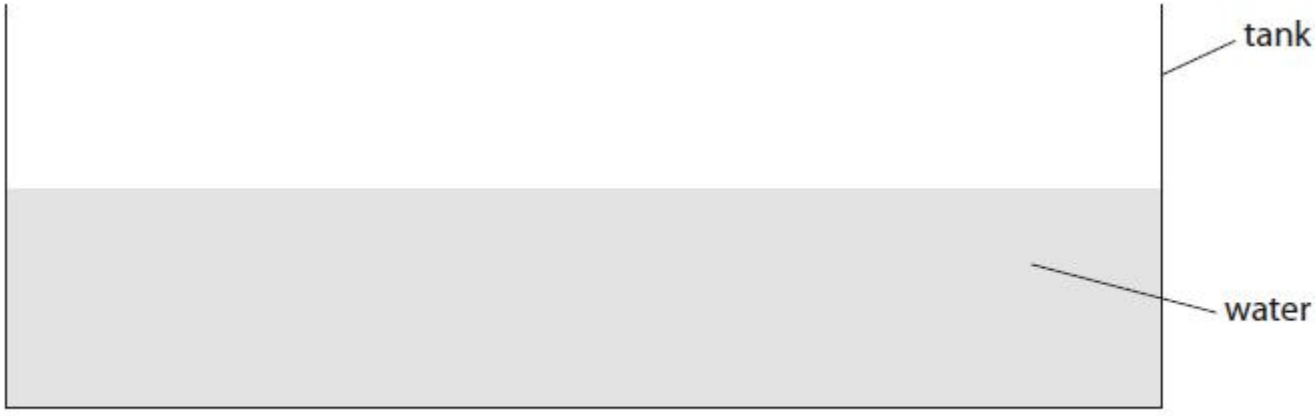

Figure 23

(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)

.....

.....

.....

.....

(iii) Figure 24 shows an object on the bottom of the tank of water.

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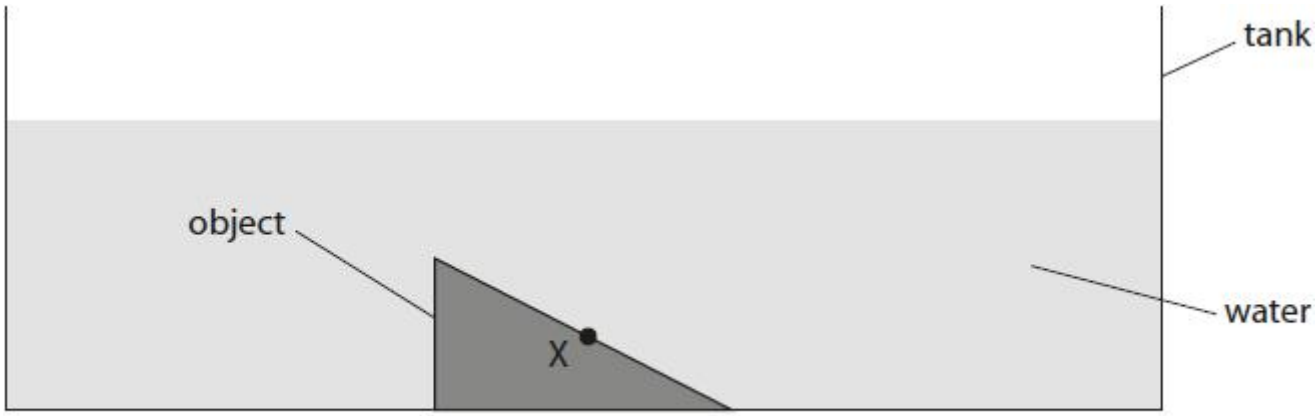

Figure 24

Draw an arrow on Figure 24 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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Q2.

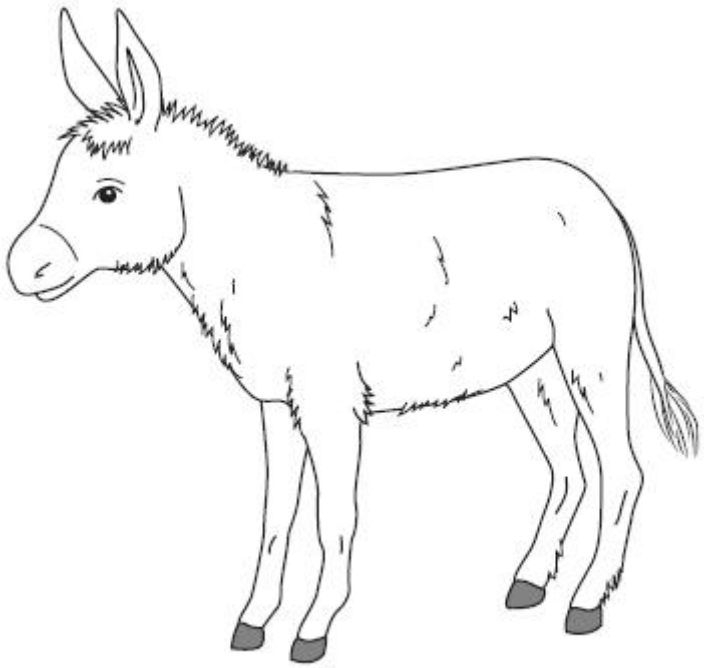

Figure 23

A donkey has a weight of 2500 N.

The area of each hoof is 0.022 m^2.

(i) Calculate the average pressure that the donkey exerts on the ground.

Use the equation

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

(2)

average pressure = ... Pa

(ii) Figure 24 shows how the shape of a camel's hoof is different from the shape of a donkey's hoof.

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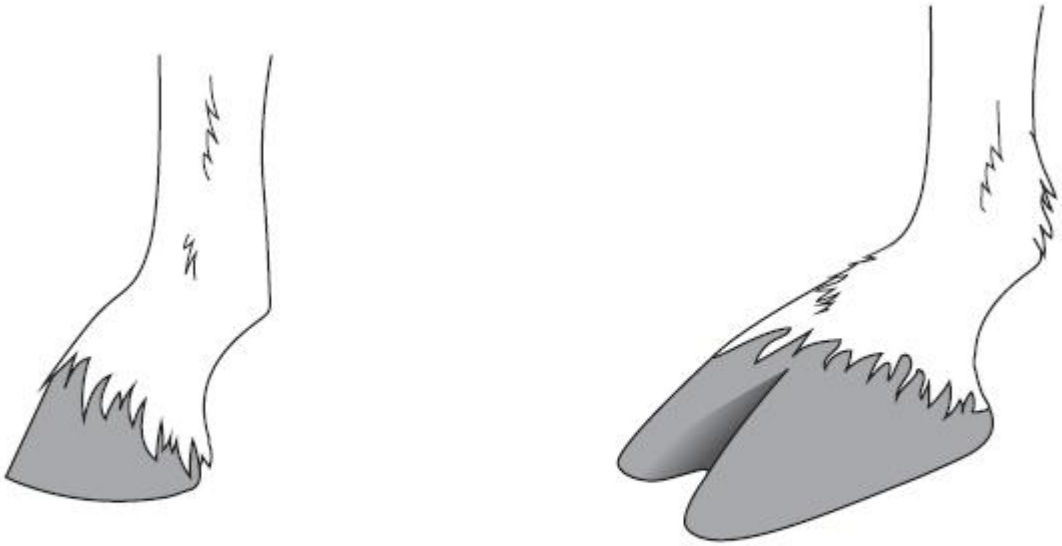

donkey hoof

camel hoof

Both diagrams are drawn to the same scale.

Figure 24

The camel and the donkey have the same mass.

Explain how a camel's hoof is a more suitable shape than a donkey's hoof for walking on soft ground.

(2)

.....

.....

.....

(Total for question = 4 marks)

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Q3.

Figure 26 shows an ice skater standing on one skate.

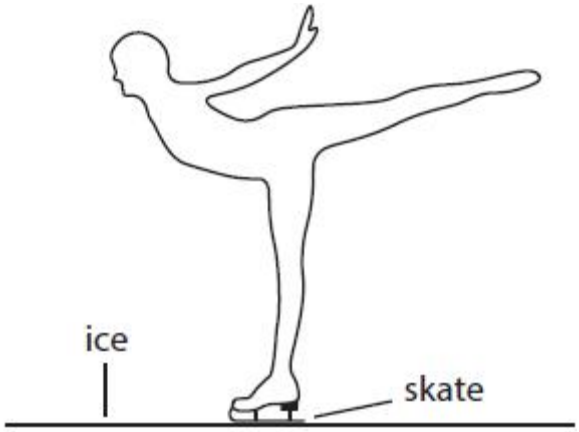

Figure 26

Calculate the force the skate exerts on the ice.

pressure of skate on ice = 4.8×10^{7} Pa

area of blade in contact with ice = 1.2×10^{-5} m^2

Use the equation

force = pressure × area

Give your answer to 2 significant figures.

(3)

force = ... N

(Total for question = 3 marks)

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Q4.

Figure 17 shows a bicycle pump with a closed end.

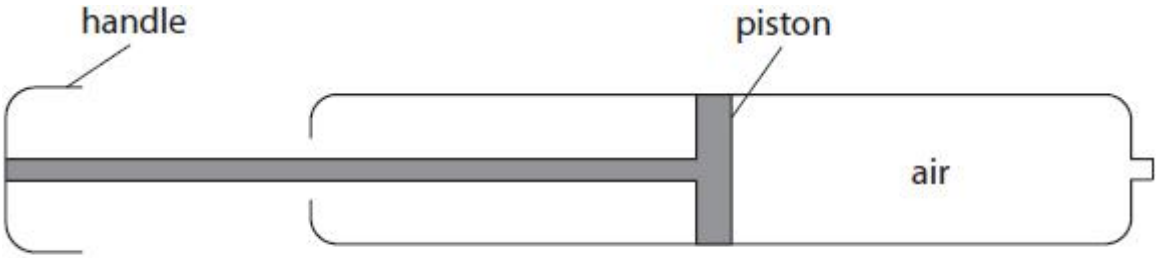

Figure 17

The area of the piston is 2 cm^2.

A force of 28 N is applied to the piston.

Calculate the pressure, in N/cm^2, of the piston on the air in the bicycle pump.

(3)

pressure = ... N/cm^2

(Total for question = 3 marks)

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Q5.

Figure 4 shows a container of length 6.0 m and width 2.0 m resting on a floor.
The weight of the container is 15 000 N.

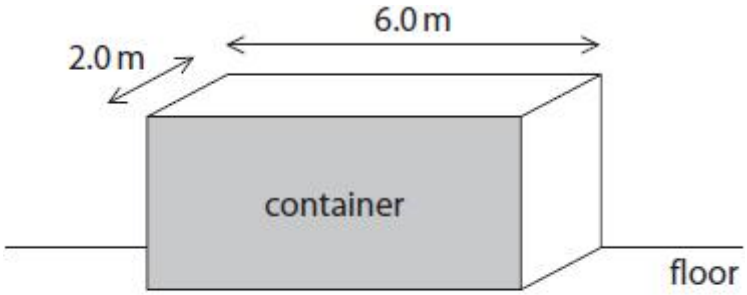

Figure 4

Calculate the pressure that the container exerts on the floor.

Use the equation

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

(3)

pressure of the container on the floor = ... Pa

(Total for question = 3 marks)

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