Pressure

Question Paper

Course	CIE IGCSE Physics
Section	1. Motion, Forces & Energy
Topic	Pressure
Difficulty	Easy

Time Allowed 50

Score /37

Percentage /100

Question 1a

A student is studying elephants. Fig. 2.1 shows an elephant.

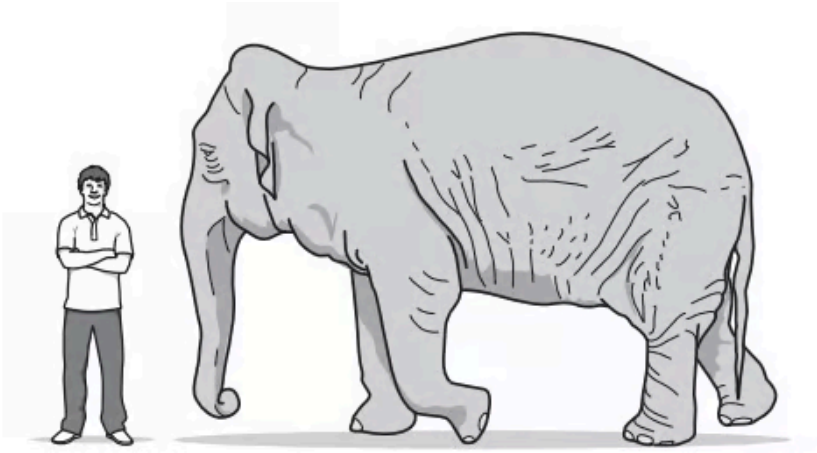

Fig. 2.1

The student measures the elephant and records the values, as shown in the table.

Complete the table by adding a suitable unit for each measurement. Choose the units from those shown in the box.

m^2	kg	cm	mm^2	g	m	cm^2	mg	mm

measurements	value	unit
mass of elephant	4000	
height of elephant	3.0	
surface area of elephant foot	0.125	

[2 marks]

Question 1b

Using information from the table in **(a)**:

(i) Calculate the weight of the elephant.

weight = ... N [3]

(ii) Calculate the pressure the elephant exerts on the ground when it is standing on four feet. Include a unit.

pressure = ... [4]

[7 marks]

Question 2a

Complete the sentence defining pressure in solids.

Pressure is defined as the _____ per unit _____.

[2 marks]

Question 2b

Complete the word equation defining pressure in solids.

Pressure in a solid is the _____ ÷ _____.

[2 marks]

Question 2c

The table shows some everyday examples of objects which exert a pressure.

For each one identify whether the object would exert high pressure or low pressure.

	High or Low Pressure?
High heeled shoe	
Snowshoes	
Kitchen knife	
Point of a nail	
Skis	

[1 mark]

Question 2d

A student of weight 550 N is wearing shoes so that his two feet have a total area of 0.020 m^2.

Calculate the pressure exerted by the student on the ground when standing on both feet.

[3 marks]

Question 3a

Describe how the pressure beneath the surface of a liquid changes

(i) With depth.

[1]

(ii) With density of the liquid.

[1]

[2 marks]

Question 3b

Extended tier only

Complete the word equation defining pressure in liquids.

Pressure in a liquid is the _____ of the liquid × gravitational field strength × change in _____.

[2 marks]

Question 3c

Fig. 1 shows two pairs of objects in a column of liquid.

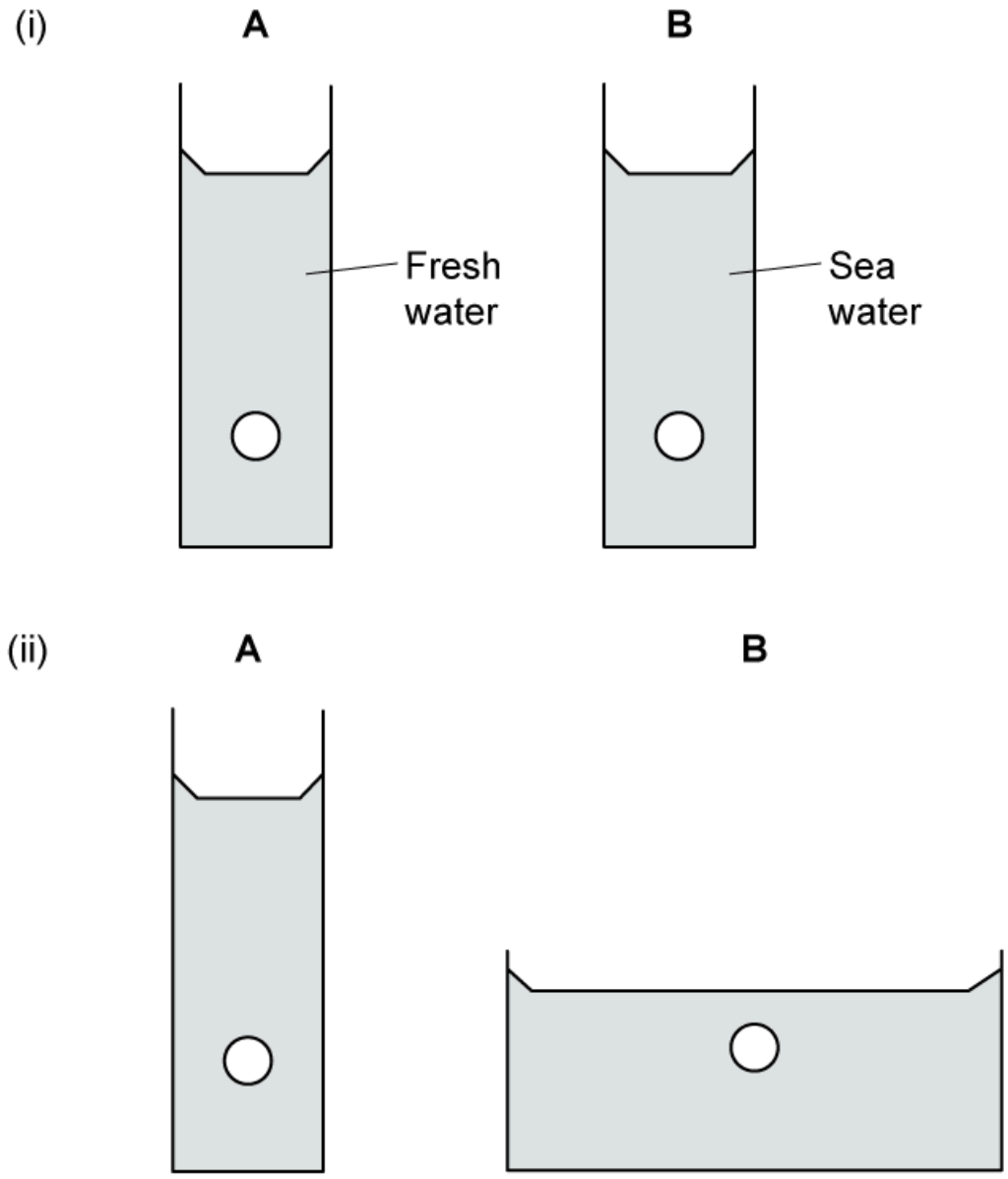

Fig. 1

For each pair identify the object which experiences the **highest** pressure and explain your reason.

[1 mark]

Question 3d

Extended tier only

A swimmer dives to the bottom of a swimming pool which is 2 m deep. Calculate the pressure on the swimmer. The density of the water in the pool is 1000 kg/m^3.

[3 marks]

Question 4a

The weight of a car is 20 000 N. For each tyre, the area in contact with the road is 0.1 m^2.

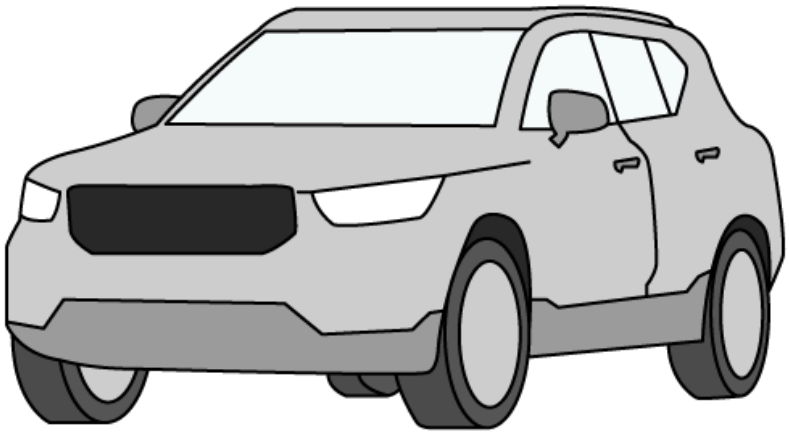

Fig. 1

For the car shown in **Fig. 1**, calculate the total area of the car tyres which are in contact with the road surface.

[1 mark]

Question 4b

Calculate the total pressure exerted by the car on the road.

[3 marks]

Question 4c

The family who own the car are going on holiday. They add a roof-rack filled with heavy camping equipment.

State how this will affect the pressure which the car exerts on the road.

[1 mark]

Question 4d

Explain your answer to part (c).

[1 mark]

Question 5a

The weight of the skier shown in Fig.1 is 750 N. For each ski, the area in contact with the snow is 0.2 m^2.

Fig. 1

Calculate the total area of the skis which is in contact with the snow.

[1 mark]

Question 5b

Calculate the total pressure exerted by the skier on the snow.

[3 marks]

Question 5c

The skier has been told that using narrower skis will make her go faster.

She switches to skis which each have a surface area of 0.15 m^2.

State how this will affect the pressure which the skier exerts on the snow.

[1 mark]

Question 5d

Explain your answer to part (c).

[1 mark]