

PRESSURE-PAPER-4-SET-2-QP-MS

- 1** (a) The polar bear has a weight of 4000N .

The polar bear stands with all four feet in contact with the ice. Each foot of the polar bear has an area of 0.035 m^2 .

Calculate the pressure exerted by the polar bear on the ice.

State the formula you use and show your working.

formula

working

pressure = N/m^2 [2]

MARKING SCHEME

	pressure = force / area / 4000 / 4 × 0.035 ; 28 600 (N/m ²) ;	2
--	--	---

www.smartexamresources.com

2 (a) Fig. 12.1 shows an aircraft being refuelled using a plastic pipe.

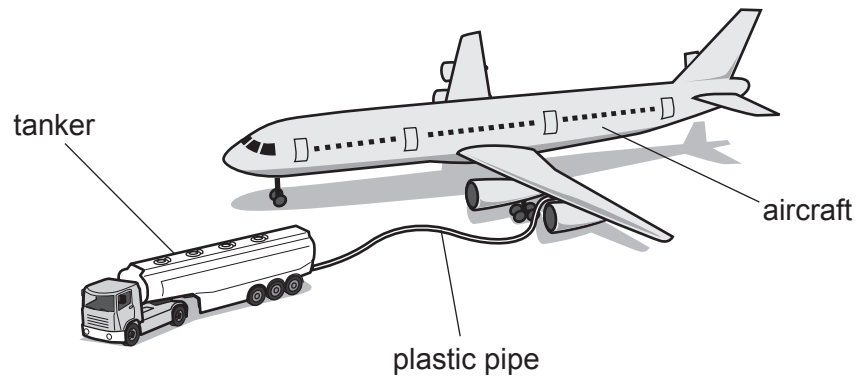


Fig. 12.1

As the fuel flows through the pipe, the fuel and pipe become electrically charged.

Explain why the fuel becomes negatively charged and the pipe becomes positively charged.

.....

.....

..... [2]

(b) Fig. 12.2 is the speed-time graph for the aircraft during take-off.

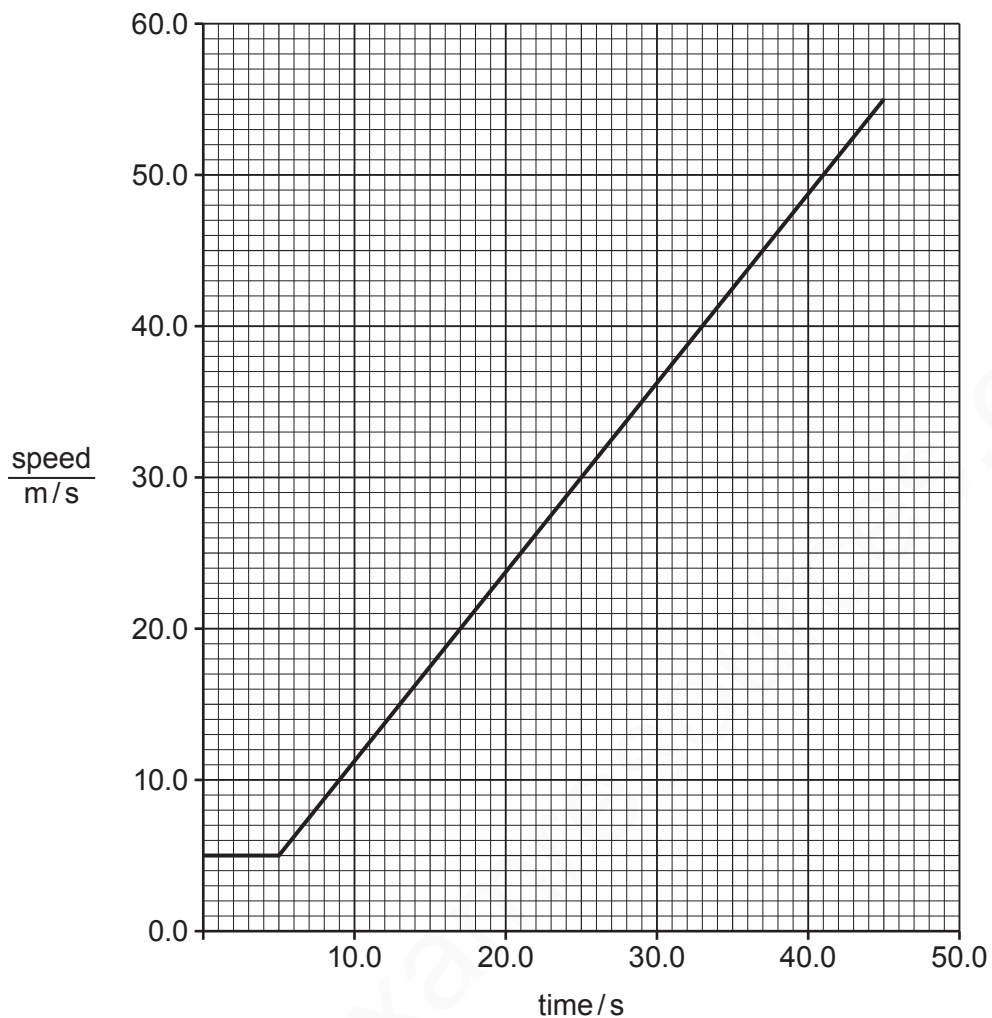


Fig. 12.2

(i) Calculate the acceleration at 25 seconds.

acceleration = m/s² [2]

(ii) State how the graph shows that the acceleration of the aircraft is constant between 5.0 s and 45.0 s.

.....
..... [1]

- (c) (i) During the flight the pressure inside the aircraft cabin decreases but the temperature is kept constant.

Use ideas about gas molecules to describe the change in pressure in terms of the arrangement and motion of molecules.

.....
.....
.....
..... [2]

- (ii) The aircraft flies at a high altitude. Some water on the outside of the aircraft body turns to ice.

Describe in terms of molecular motion and arrangement how ice differs from liquid water.

.....
.....
..... [2]

[Total: 9]

MARKING SCHEME

(a)	transfer of electrons; from pipe to fuel;	2
(b)(i)	correct working (e.g. 50/40) ; 1.25 (m/s ²) ;	2
(b)(ii)	straight line;	1
(c)(i)	molecules further apart ; fewer molecules collide with, surfaces / walls, in unit time / lower frequency of collision of molecules with, surfaces / walls ;	2
(c)(ii)	molecular motion – molecules in liquid water can move throughout but molecules in ice vibrate about a fixed point ; molecular arrangement – molecules in liquid water in random arrangement / molecules in ice in regular arrangement ;	2