3.21 Particle Motion, Gas Pressure and Temperature: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A sealed container of gas is heated. State what happens to the average speed of the gas particles, and explain your answer in terms of kinetic energy.

(Total for Question 1 is 2 marks)

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2 Higher tier. A fixed mass of gas has a volume of 6.0 m^3 at a pressure of 240 kPa. The gas expands at constant temperature until its volume is 16 m^3. Show that the new pressure of the gas is 90 kPa. Use p1V1 = p2V2.

(Total for Question 2 is 3 marks)

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3 Higher tier. A sealed syringe contains 60 cm^3 of gas at a pressure of 100 kPa. Aditi compresses the gas, at constant temperature, until its volume is 24 cm^3. Calculate the new pressure of the gas. Use p1V1 = p2V2.

(Total for Question 3 is 3 marks)

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Mark scheme · 3.21 Particle Motion, Gas Pressure and Temperature: 10-minute Pack

Question 1

the average speed of the particles increases, oe	**B1**
because the average kinetic energy of the particles increases as the temperature increases, oe	**B1**

Answer: The average speed increases, because the average kinetic energy of the particles increases as the temperature rises.

Question 2

correct substitution shown: 240 * 6.0 = p2 * 16, oe	**M1**
correct rearrangement/calculation: p2 = (240 * 6.0) / 16 (= 1440 / 16), oe	**M1**
working correctly leads to p2 = 90 kPa cao	**A1**

Answer: 90 kPa (shown)

Question 3

correct substitution: 100 * 60 = p2 * 24, oe	**M1**
correct rearrangement: p2 = (100 * 60) / 24, oe	**M1**
250 kPa cao	**A1**

Answer: 250 kPa

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