Physics

Second Secondary Grade

20
26

Home Work

Week 14

Name: ....

Class: ....

School: ....

إعـداد

عبد الله مصطفي – حسن أشرف

مراجعة

محمد عنتر – مجدي فتحي
عمرو مالي

مكتب مستشار العلوم

عبدالله مصطفى – سعيد محمد

إشراف

د/ عزيزة رجب خليفة
مستشار العلــــوم

إشراف عام

د/ هالــــة عبــد السلام
رئيس الإدارة المركزية للتعليم العام

Chapter 6| Charle´s Law

First: Multiple Choice Questions

1) If the volume of a given amount of gas at **0°C** is **450 cm³**, its volume at **91°C**, assuming constant pressure, is ....

(A) 321 cm³

(B) 421 cm³

(C) 600 cm³

(D) 333.5 cm³

2) Which graph correctly represents the relationship between the absolute temperature of a gas and its coefficient of volumetric expansion at constant pressure?

(D) (C) (B) (A)
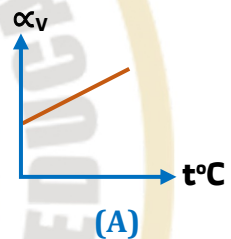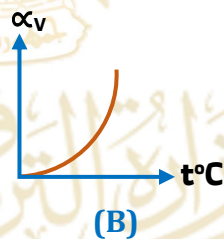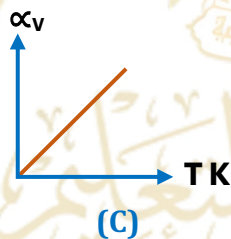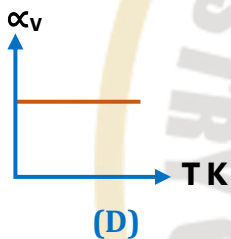
3) Which mathematical expression correctly represents the relationship between the temperature of a given amount of gas on the Celsius scale and its volume at constant pressure?

(A) $\dfrac{Vol_1}{Vol_2} = \dfrac{t_2}{t_1}$

(B) $\dfrac{Vol_1}{Vol_2} = \dfrac{1+\propto_v t_1}{1+\propto_v t_2}$

(C) $\dfrac{Vol_1}{Vol_2} = \dfrac{t_1}{t_2}$
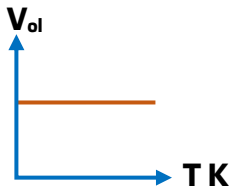
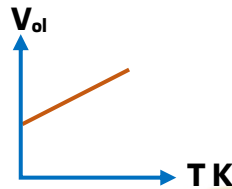(D) $\dfrac{Vol_1}{Vol_2} = \dfrac{1+\propto_v t_2}{1+\propto_v t_1}$

4) A gas sample has volume **4 L** at **100∘C**. The required change in temperature (in kelvins) to reduce its volume to quarter of its initial value is ....

(A) 25 K

(B) 75 K

(C) 93.25 K

(D) 279.75 K

5) If the absolute temperature of a gas increases by **20%**, its volume ....

(A) decreases by 20%   (B) increases by 20%

(C) decreases by 25%   (D) increases by 25%

6) If the volume of a given amount of gas at **0°C** equals **1 L**, the temperature required to increase the gas volume by **1 L** (at constant pressure) is ....

(A) 273∘C

(B) 373∘C

(C) 273 K

(D) 373 K

7) An open vessel contains a gas of volume **273 cm^3** at **0°C**. The volume of gas that leaves the vessel if the vessel is heated by **0.5 K** is ....

(A) 136.5 cm^3

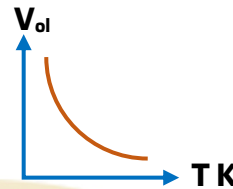(B) 0.5 cm^3

(C) 273.5 cm^3

(D) 3.6×10^{-3} cm^3

8) Which graph correctly represents the relationship between the volume of a given amount of gas and its temperature at constant pressure?
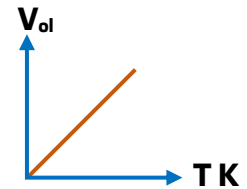
Vol (D)	Vol (C)	Vol (B)	Vol (A)
horizontal line — T K	increasing line — T K	decreasing curve — T K	increasing line from origin — T K

Second: Essay Questions

9) A gas has a volume of **200 cm³** at **27°C**. Calculate: its volume at **77°C**

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10) In Charles's experiment to determine the coefficient of volumetric expansion of a gas at constant pressure, the length of the air column was **12 cm** when the tube was immersed in crushed ice, and it became **16.4 cm** at **100°C**.

Calculate: the value of the coefficient of volumetric expansion of the gas at constant pressure.

- The end -

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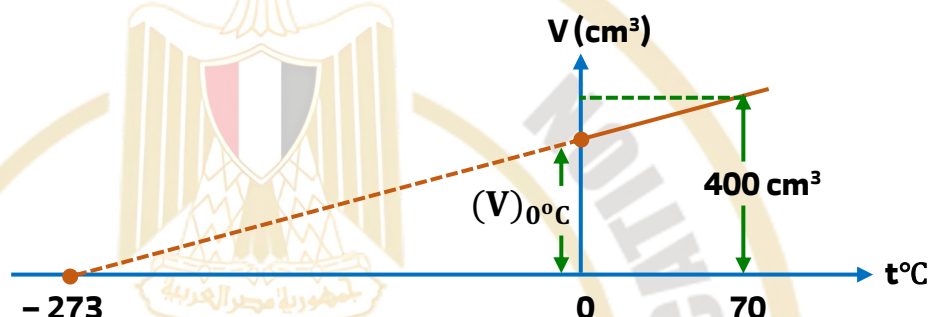
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Chapter 6| Charle´s law

Group (A)

First: Multiple Choice Questions

1) The opposite graph represents the relationship between the volume **V** of a given amount of gas and its temperature in degrees Celsius (**t°C**). From the graph, the value of **V(0∘C)** is ....

(A) 275.7 cm³

(B) 546.5 cm³

(C) 318.4 cm³

(D) 373.2 cm³

V (cm³)

(V)$_{0°C}$

400 cm³

− 273   0   70   t°C

2) A quantity of gas at **25°C** is heated to **30°C** while its pressure remains constant, and its volume increases by **1.5 cm³**. Its original volume is ....

(A) 70.4 cm³   (B) 81.9 cm³

(C) 89.4 cm³   (D) 90.4 cm³

3) A certain mass of gas has a volume of **4 cm³** at **25°C**. Its new volume when its temperature is lowered to **−50∘C**, assuming constant pressure, is ....

(A) 1 cm³

(B) 1.5 cm³

(C) 3 cm³

(D) 2 cm³

4) The correct mathematical expression of Charles's law is ....

(A) $P \cdot V_{ol}$ = Constant

(B) V_{ol} / T = Constant

(C) P / T = Constant

(D) $P V_{ol} / T$ = Constant

Second: Essay Questions

5) A quantity of gas has a volume of **4 L** at a temperature of **27°C**. Its temperature is increased while the pressure remains constant, causing its volume to increase by **5 L**. **Calculate**: the increase in its temperature.
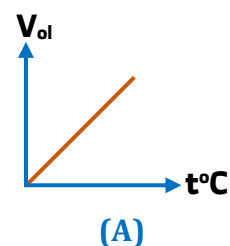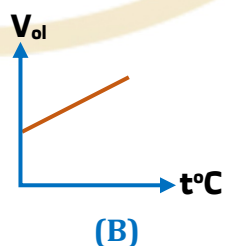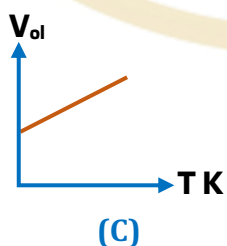

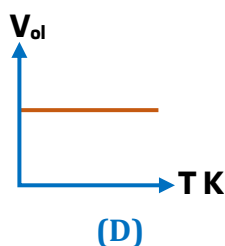--

Group (B)

First: Multiple Choice Questions

1) The correct graph that represents the relationship between the volume of a given amount of gas and its temperature at constant pressure is ....

(D)   (C)   (B)   (A)

2) If the change in volume of a certain mass of gas is **21.978 cm³**, and the change in temperature at constant pressure is **60∘C**, given that the original volume of the gas at **0°C** is **100 cm³**, then the coefficient of volumetric expansion of the gas at constant pressure is ....

(A) 3.66 K^{-1}

(B) 0.366 K^{-1}

(C) 0.0366 K^{-1}

(D) 0.00366 K^{-1}

3) The increase in volume of a given amount of gas at constant pressure depends on ....

(A) The volume of the gas at 0∘C and the change in the gas temperature

(B) The volume of the gas at 0∘C and the type of gas

(C) The change in the gas temperature and the type of gas

(D) It is constant for all gases

4) A given quantity of gas has a volume of **1 L**. If its temperature is increased by **1∘C** at constant pressure, the increase in its volume will be ....

(A) 273 L

(B) 0.00366 L

(C) 373 L

(D) 0.00268 L

5) A quantity of gas has a volume of **3 L** at a temperature of **27°C**. Its temperature is raised to **227°C** while the pressure remains constant.

Calculate: its volume after the temperature increase.

Group (C)

First: Multiple Choice Questions

1) When heating an open vessel containing a gas, the volume of the gas in the vessel after heating will ....

(A) Decrease

(B) Increase

(C) Remain constant

(D) Decrease or increase depending on the amount of temperature rise

2) **1 liter** of oxygen gas is at **0°C**. Its temperature is raised by **273°C** while the pressure remains constant. Its volume then becomes ....

(A) 1 L

(B) 2 L

(C) 273 L

(D) 0.5 L

3) The coefficient of volumetric expansion of a gas at constant pressure is equal to ....

(A) $\frac{1}{273}$ K

(B) $\frac{1}{273}$ K^{-1}

(C) $-\frac{1}{273}$ K^{-1}

(D) $\frac{1}{273}$ °C

4) A capillary tube of length **20 cm** contains a **5 cm** thread of mercury that traps a quantity of air whose length is **10 cm** at **30∘C**. The maximum temperature that can be measured with this tube without the mercury spilling out is ....

(A) 318°C

(B) 45°C

(C) 454.5°C

(D) 181.5°C

Second: Essay Questions

5) A quantity of gas at a temperature of **17°C** is heated by **100°C** while its pressure remains constant, causing its volume to increase by **2.5 cm³**.

Calculate: its volume before heating.

– The end -