



الإدارة المركزية للتعليم العام

تنمية مادة العلوم

Physics

الصف الثاني الثانوي

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الواجب المنزلي + التقييم



الأسبوع 2



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رئيس الإدارة المركزية للتعليم العام



Dimensional formula - Multiples and fractions of units - Measurement error

First: Choose the correct answer:

- 1-Which of the following correctly expresses the concept of dimensional formula?
 - a) The relationship between numerical values of physical quantities.
 - b) Expressing the physical quantity in terms of the fundamental quantities.
 - c) Expressing the physical quantity using SI units only.
 - d) The mathematical relationship between derived quantities.
- 2-The unit of measurement of a physical quantity with dimensions $M^0 L T^{-2}$ is:
 - a) m/s
 - b) kg·m/s⁻²
 - c) m/s²
 - d) m·s²
- 3-If the dimensional formula of quantity **A** is $M L T^{-2}$, and of **B** is $M L T^{-2}$, then the dimensional formula of (A - B) is:
 - a) $M^0 L^0 T^0$
 - b) $M.L.T^{-2}$
 - c) $M.L.T$
 - d) $M.L.T^4$
- 4-If the dimensional formula of **A** is $L.T^{-1}$, and of **B** is T^{-1} , then the dimensional formula of (A × B) is:
 - a) $L.T^{-1}$
 - b) T^{-2}
 - c) $L.T^{-2}$
 - d) $L.T^0$
- 5-Three physical quantities X, Y, Z have the following dimensional formulas respectively: MLT^{-1} , MLT^{-2} , T
Which of the following relations could be correct?
 - a) $Z = XY$
 - b) $Z = \frac{X}{Y}$
 - c) $Z = \frac{Y}{X}$
 - d) $Z = Y^2/X$
- If the wavelength of red light is $0.7 \mu m$, then its wavelength in millimeters equals:
 - a) 7×10^{-3}
 - b) 7×10^{-4}
 - c) 7×10^{-6}
 - d) 7×10^{-7}
- 6-An electric current has a magnitude of 7 mA. Its value in μA is:
 - a) 7×10^3
 - b) 7×10^6
 - c) 7×10^9
 - d) 7×10^{12}



7-To measure the density of a liquid directly, is used

- a) Ruler b) Micrometer c) Hydrometer d) Graduated cylinder

8-To measure a physical quantity accurately, the line of sight must be the instrument scale.

- a) Parallel to b) Perpendicular to c) Above d) Below

Second: Essay Questions:

9-A group of students estimated the mass of a gold ring, but the measurement was inaccurate. What are the possible sources of error in measurement?

10- Express the following quantities in the required units using scientific formula:

(a) 88 kg , in milligrams

(b) 1.8 MW, in kilowatts

(c) 50 mg, in kilograms

(d) 0.4 μg , in milligrams

Group (A)

1-The dimension formula of pi (π) is

a) $M^0 .L. T^0$

b) $M^0 .L.^0 T^0$

c) $M^0 .L.T$

d) $M.L.T$

2-The physical quantity that has dimensional formula of LT^{-1} ,so its unit in the Gaussian system is

a) $g.cm^{-1}$

b) $cm.s^{-1}$

c) $m.s^{-1}$

d) $m.s$

3-Density = $\frac{mass}{volume}$ so the dimensional formula and unit of measurement in the British system

a) ML^{-3} , pound/foot³

b) ML^{-3} , g/cm³

c) ML^3 , pound/foot³

d) ML^{-3} , kg/m³

-Write each of the following quantities in the required unit between brackets:

4) Train speed 180 km/h. (in unit of m/s).

5) Vehicle speed 50 m/s. (in unit of km/h).

Group (B)

1-If the quantity X is calculated from the relation $X = Y + Z$ and the equation for the dimensions of Z is $M L T^{-2}$, then the unit of measurement of quantity Y is

.....

a) Newton

b) joule

c) watt

d) kg m/s

2-If you know that $\frac{K}{t} = F \cdot d + \frac{R}{t^2}$

So the dimensional formula of the quantity $(\frac{R}{K})$ is

a) $M L^0 T^0$

b) $M^0 L^0 T$

c) $M^0 L T^0$

d) $M^0 L^0 T^{-1}$

3- If the dimensional formula of the physical quantity (X) is $M L^2 T^{-2}$ and the dimensional formula of the physical quantity (Y) is $L T^{-2}$ so the measuring unit of the quantity $(\frac{X}{Y})$ in the British system is

a) pound.s

b) pound.foot

c) g.cm

d) kg.m

4-Explain:

The existence of an error in the Ammeter measurement after several years of operating it ?

5-Write each of the following quantities in the required unit between brackets:

Gold density 19300 kg/m^3 (in unit of g/cm^3)

Group (C)

1- If the distance between the atoms in a crystal is 9×10^{-4} mm, then this is equal to

a) 9×10^{-7} cm

b) 9×10^{-5} cm

c) 9×10^{-9} cm

d) 9×10^{-10} cm

2-If mass C = sum of two masses A = 3 tons, B = 6000 g ,then mass C is equal to kg

a) 3600

b) 6003

c) 63000

d) 3006

3-An example of direct measurement is a measurement of

a) Room area by metric tape

b) Body mass by a sensitive scale

c) Density of a liquid measured by its mass and volume

d) cuboid volume by measuring length, width and height

4-Explain:

The sensitive scale is kept inside a glass box?

5-Write each of the following quantities in the required unit between brackets:

Aluminum density 2.7 g/cm^3 (in unit of kg /m^3)