

Physical Quantities and Units – 2021 AS

1. June/2021/Paper_11/No.1

What is a reasonable estimate of the volume of an adult person?

- A 0.10m^3 B 0.50m^3 C 1.0m^3 D 2.0m^3

2. June/2021/Paper_11/No.2

Which combination of units could be used for expressing the power dissipated in a resistor?

- A newton per second (N s^{-1})
B newton second (N s)
C newton metre (N m)
D newton metre per second (N m s^{-1})

3. June/2021/Paper_12/No.1

What is **not** a reasonable estimate of the physical property indicated?

- A $2 \times 10^3\text{W}$ for the power dissipated by the heating element of an electric kettle
B $4 \times 10^2\text{m}^3$ for the volume of water in a swimming pool
C $5 \times 10^5\text{Ns}$ for the momentum of a lorry moving along a road
D $6 \times 10^2\text{N}$ for the weight of a fully grown racehorse

4. June/2021/Paper_12/No.2

Which quantity could have units of N m V^{-1} ?

- A acceleration
B charge
C current
D resistance

5. Nov/2021/Paper_11/No.1

What is essential when recording a measurement of a physical quantity?

- A the measurement has an SI unit
- B the measurement has a unit and a number
- C the measurement has a unit given as a base unit
- D the measurement is from an analogue scale

6. Nov/2021/Paper_11/No.2

The mobility μ of electrons travelling through a metal conductor can be calculated using the equation

$$\mu = \left(\frac{e}{m} \right) \tau$$

where e is the charge on an electron and m is its mass. The average time between the collisions of an electron with the atoms in the metal is τ .

What are the SI base units of μ ?

- A A kg^{-1} B $\text{A s}^2 \text{kg}^{-1}$ C A s kg^{-1} D $\text{A s}^{-2} \text{kg}^{-1}$

7. Nov/2021/Paper_12/No.1

Which row shows what all physical quantities must have?

| | magnitude | direction | unit |
|---|-----------|-----------|------|
| A | ✓ | ✓ | ✓ |
| B | ✓ | ✓ | x |
| C | ✓ | x | ✓ |
| D | x | x | ✓ |

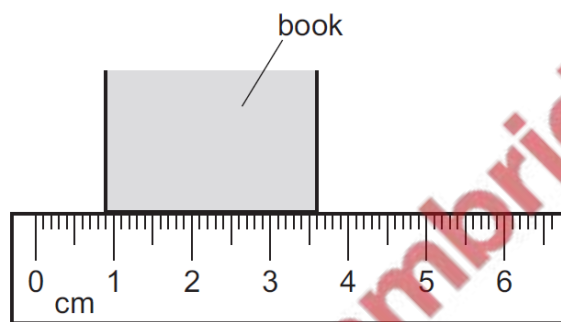
8. Nov/2021/Paper_12/No.2

What is an alternative way of expressing an energy of 43 dJ?

- A $4.3 \times 10^3 \text{ mJ}$
- B $4.3 \times 10^3 \text{ MJ}$
- C $4.3 \times 10^{-3} \text{ mJ}$
- D $4.3 \times 10^{-3} \text{ MJ}$

9. Nov/2021/Paper_13/No.1

A paperback book contains 210 sheets of paper (pages). Its thickness is measured with a ruler, as shown.



What is the average thickness of one sheet of the paper in the book?

- A 0.013 mm
- B 0.017 mm
- C 0.13 mm
- D 0.17 mm

10. Nov/2021/Paper_13/No.2

What is the unit of resistance when expressed in SI base units?

- A $\text{kg}^{-1} \text{ m}^{-2} \text{ s A}^2$
- B $\text{kg}^{-1} \text{ m}^{-2} \text{ s}^3 \text{ A}^2$
- C $\text{kg m}^2 \text{ s}^{-1} \text{ A}^{-2}$
- D $\text{kg m}^2 \text{ s}^{-3} \text{ A}^{-2}$

11. Nov/2021/Paper_13/No.3

Which list consists only of scalar quantities?

- A acceleration, displacement, force, weight
- B density, energy, frequency, velocity
- C distance, pressure, temperature, time
- D momentum, power, volume, wavelength