



Answers

Multiple-choice questions

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. D | 2. B | 3. C | 4. A | 5. A |
| 6. C | 7. D | 8. C | 9. B | 10. D |
| 11. B | 12. C | 13. D | 14. B | 15. B |
| 16. D | 17. C | 18. A | 19. C | 20. A |
| 21. D | 22. C | 23. B | 24. B | 25. C |
| 26. D | 27. A | 28. A | 29. C | 30. B |

Contextual questions

- Metre (m) used to measure length.
 - Second (s) used to measure time.
 - Kilogram (kg) used to measure mass.
 - Ampère (A) used to measure current.
 - Kelvin (K) used to measure temperature.
 - Candela (cd) used to measure light intensity.
 - Mole (mol) used to measure the amount of matter.
- For the CGS system length is measured in centimetres and not in metres as in the SI system. For the CGS system mass is measured in grams and not in kilograms as in the SI system. For both systems time is measured in seconds.
- The newton is equivalent to $\text{kg}\cdot\text{m}\cdot\text{s}^{-2}$. This is a combination of various fundamental SI units.
- 4.1 $35\,000\text{ g} = 35\text{ kg}$
- 4.2 $0,000\,000\,004\text{ m} = 4\text{ nm}$
- 4.3 $586\,000\,000\,000\text{ kg} = 586\text{ Tg}$
- 4.4 $0,000\,036\text{ g} = 36\text{ }\mu\text{g}$
- 4.5 $650\,000\,000\text{ m} = 650\text{ Mm}$
- 4.6 $0,002\,561\text{ g} = 2,561\text{ mg}$
- 4.7 $0,005\text{ m} = 5\text{ mm}$



| | | SI system | CGS system |
|-----|-------------|--------------------|------------------------|
| 5.1 | 300 mg | 0,000 3 kg | 0,3 g |
| 5.2 | 700 ton | 700 000 kg | 700 000 000 g |
| 5.3 | 0,063 km | 63 m | 6 300 cm |
| 5.4 | 240 μ g | 0,000 000 24 kg | 0,000 000 000 24 kg |
| 5.5 | 0,69 nm | 0,000 000 000 69 m | 0,000 000 000 006 9 cm |
| 5.6 | 30 h | 108 000 s | 108 000 s |
| 5.7 | 15 min | 900 s | 900 s |
| 5.8 | 50 ms | 0,05 s | 0,05 s |

6.1 $0,000\ 000\ 0467 = 4,67 \times 10^{-8}$

6.2 $0,002\ 59 = 2,59 \times 10^{-3}$

6.3 $4\ 350\ 000 = 4,35 \times 10^6$

6.4 $271\ 000 = 2,71 \times 10^5$

6.5 $3\ 000\ 000\ 000 = 3 \times 10^9$

6.6 $0,005 = 5 \times 10^{-3}$

6.7 $0,034 = 3,4 \times 10^{-2}$

6.8 $3\ 582 = 3,582 \times 10^3$

7.1 $E_p = mgh$
 $E_p = 30(9,8)(15)$
 $E_p = 4\ 410\ \text{J}$

7.2 $E_k = \frac{1}{2}mv^2$
 $E_k = \frac{1}{2}(43)(52)^2$
 $E_k = 58\ 136\ \text{J}$

7.3 $a = \frac{v_f - v_i}{\Delta t}$
 $a = \frac{30 - 5}{10}$
 $a = 2,5\ \text{m}\cdot\text{s}^{-2}$

7.4 $E_p = mgh$
 $460 = 225(9,8)h$
 $h = 0,21\ \text{m}$

7.5 $E_k = \frac{1}{2}mv^2$
 $2\ 440 = \frac{1}{2}m(12)^2$
 $m = 33,89\ \text{kg}$

7.6 $a = \frac{v_f - v_i}{\Delta t}$
 $3 = \frac{15 - 3}{\Delta t}$
 $\Delta t = 4\ \text{s}$