

Revision Sheet

A-Level Physics · Unit 1 Physical quantities and units

24 vocabulary items · 39 marks of exam questions (10 questions)

Part 1 · Vocabulary review answer key. Section A wants the exact English spelling.

Question	Answer	Marks
1	physical quantity	1
2	magnitude	1
3	unit	1
4	mass	1
5	SI units	1
6	base quantity	1
7	length	1
8	current	1
9	temperature	1
10	derived unit	1
11	prefix	1
12	uncertainty	1
13	systematic error	1
14	zero error	1
15	accuracy	1
16	precision	1
17	random error	1
18	absolute uncertainty	1
19	percentage uncertainty	1
20	derived quantity	1
21	scalar	1
22	vector	1
23	perpendicular	1
24	component	1

Multiple Choice Answers

Q25: A

Q26: D

Multiple Choice Answers

Q27: A

Q28: C

29(a)	only ampere and kilogram underlined
29(b)(i)	percentage uncertainty = $2.1 + 0.6 + (1.5 \times 2)$
	= 5.7%
29(b)(ii)	absolute uncertainty = $(5.7 / 100) \times 8.245 \times 10^9$
	(= 4.7×10^8 Pa or 0.47×10^9 Pa)
	$E = (8.2 \pm 0.5) \times 10^9$ Pa

30(a)	(SI base unit of α =) $\text{m}^3 \text{s}^{-1} \times \text{m} / \text{m}^4 = \text{s}^{-1}$
30(b)	(percentage uncertainty =) $3 + 4 + 2 \times 4 = 15$ (%)
30(c)	$\alpha = QL / r^4$
	= $2.72 \times 10^{-8} \times 2.5 \times 10^{-2} / (7.1 \times 10^{-5})^4$
	= 2.7×10^7
	absolute uncertainty = $0.15 \times [2.7 \times 10^7]$
	= 0.4×10^7
	$\alpha = (2.7 \pm 0.4) \times 10^7 \text{s}^{-1}$

31(a)	force $\times$ displacement in the direction of the force
31(b)	units: $\text{kg m s}^{-2} \times \text{m} = \text{kg m}^2 \text{s}^{-2}$
31(c)	T_1 : K and T_2 : K
	A : m^2 and t : s and L : m
	$c = (\text{kg m}^2 \text{s}^{-2} \text{m}) / (\text{m}^2 \text{K s})$
	= $\text{kg m s}^{-3} \text{K}^{-1}$

32(a)	10^{12}
	pico (p)
32(b)	ampere and metre both underlined (and no other units underlined)
32(c)(i)	percentage uncertainty = $3.5 + (3.0 \times 2) + 2.5 + 2.0$
	= 14%
32(c)(ii)	absolute uncertainty = $4.1 \times 10^{-7} \times 14 / 100$ = $6 \times 10^{-8} \Omega \text{ m}$

33(a)	only ampere and kelvin underlined
33(b)	initial speed / velocity is zero
	(non-zero magnitude of) acceleration is constant / uniform (and in a straight line)
33(c)(i)	$a = 2.75^2 / (2 \times 3.89)$
	= 0.97 m s^{-2}
33(c)(ii)	percentage uncertainty = $(2 \times 0.8) + 0.5$
	= 2.1%
33(c)(iii)	absolute uncertainty = $(2.1 / 100) \times 0.97$ = 0.02 m s^{-2}

34(a)	base quantity base unit derived quantity derived unit coulomb current force kilogram
	any two joined correctly
	all four joined correctly
34(b)(i)	the measurements have a small range
34(b)(ii)	(average of the) measurements not close to the true value
34(c)(i)	percentage uncertainty = $(3 + 5 + 4) / 2$
	= 6%
34(c)(ii)	absolute uncertainty = $(6 / 100) \times 15.0$ = 0.9 m s^{-1}