

Revision Sheet

A-Level Physics · Unit 9 Electricity

10 vocabulary items · 28 marks of exam questions (14 questions)

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

Question	Answer	Marks
1	charge carrier	1
2	semiconductor	1
3	number density	1
4	potential difference	1
5	resistance	1
6	ohm	1
7	Ohm's law	1
8	filament lamp	1
9	diode	1
10	thermistor	1

Question 11 (Answer: B)

- $R = \rho L/A$ for X, and Y must give the same R with length $2L$.
- So $\rho_Y(2L)/A_Y = \rho L/A$, which means $\rho_Y/A_Y = \rho/2A$.
- Halving the resistivity while keeping the same area does exactly that.

Question 12 (Answer: B)

- Rearranged, $k = (Q/t)L/(A\Delta T)$.
- Q/t is a power, $\text{kg m}^2 \text{s}^{-3}$; multiplying by m and dividing by m^2 leaves kg m s^{-3} .
- A temperature difference in SI *base* units is the kelvin, so k is $\text{kg m s}^{-3} \text{K}^{-1}$ – the degree Celsius is not a base unit.

Multiple Choice Answers

Q13: A

Multiple Choice Answers

Q14: A

Multiple Choice Answers

Q15: C

Multiple Choice Answers

Q16: D

Multiple Choice Answers

Q17: B

Multiple Choice Answers

Q18: C

Multiple Choice Answers

Q19: B

Multiple Choice Answers

Q20: D

Multiple Choice Answers

Q21: A

Multiple Choice Answers

Q22: D

23(a)	temperature decreases (so) resistance decreases
23(b)(i)	current = V / R
23(b)(ii)	$I = Anvq$
	$n = N / V$ or $n = N / AL$
	$v = (V / R) / [(V / L) (N / V) e] \text{ or } (V / R) / [A (N / AL) e]$
	$= VL / RNe$
	or
	$v = L / t$
	$= L / (Q / I)$
	$= LI / Q$
	$= L(V / R) / Ne$
	$= VL / RNe$
23(b)(iii)	time = distance / speed or Q / I
	$= L / (VL / RNe) \text{ or } Ne / (V / R)$
	time = RNe / V

24(a)	<u>sum of</u> e.m.f.(s) = <u>sum of</u> p.d.(s) or (algebraic) sum of e.m.f.(s) and p.d.(s) is zero
	around a loop/around a <u>closed</u> circuit
24(b)(i)	$I = 1.8 / 0.90$ $= 2.0 \text{ A}$
24(b)(ii)	$Q = It$
	number = $(2.0 \times 45) / 1.60 \times 10^{-19}$ $= 5.6 \times 10^{20}$
24(b)(iii)	$4.0 = 1.8 + [2.0 \times (0.35 + R)]$
	or
	$4.0 = 2.0 \times (0.90 + 0.35 + R)$
	$R = 0.75 \Omega$
24(c)(i)	$1.2 / 1.8 = 0.30 / L$
	$L = 0.45 \text{ m}$
24(c)(ii)	p.d. across XY decreases/p.d. across XP decreases
	(so) P is moved towards Y/away from X/to the right