Pearson Edexcel GCE Physics

Additional Support Worksheets: Answers

Contents

Question Number	Answer	Mark
1	**The only correct answer is B** (R, $R = \frac{\rho L}{A}$ *so new* $R = \frac{\rho 2L}{2A} = \frac{R}{2}$) A is not correct because new resistance is R C is not correct because new resistance is R D is not correct because new resistance is R	**1**
2	**The only correct answer is C** $R = \frac{V}{I} = \frac{6\text{ V}}{12\text{ A}} = 0.5\text{ A}$ for each resistor	**1**
3	**The only correct answer is B** (v is proportional to current and inversely proportional to cross-sectional area because $v = \frac{I}{nAe}$) A is not correct because $v = \frac{I}{nAe}$ C is not correct because $v = \frac{I}{nAe}$ D is not correct because $v = \frac{I}{nAe}$	**1**
4	**The only correct answer is C** (4 A as $I = \frac{P}{V} = \frac{48\text{ W}}{12\text{ V}}$) A is not correct because $I = \frac{P}{V} = \frac{48\text{ W}}{12\text{ V}}$ B is not correct because $I = \frac{P}{V} = \frac{48\text{ W}}{12\text{ V}}$ D is not correct because $I = \frac{P}{V} = \frac{48\text{ W}}{12\text{ V}}$	**1**
5	**The only correct answer is D** (thermistor) A is not correct because this would curve in the opposite direction B is not correct because this would be a straight line through the origin C is not correct because this would have a positive p.d. after threshold voltage reached	**1**
6	**The only correct answer is D** A is not correct because same material B is not correct because current the same in all parts of series circuit C is not correct because I n q and A are constant so v the same	**1**
7	**The only correct answer is D** (8.0 m) $l = \frac{RA}{\rho} = \frac{4.0\ \Omega \times 2.0 \times 10^{-6}\ \text{m}^2}{1.0 \times 10^{-6}\ \Omega\,\text{m}} = 8.0\text{ m}$	**1**
8	**The only correct answer is A** (W) Electrical potential = 0 at Z and increases towards W.	**1**

9	**The only correct answer is B** (number of conduction electrons in 1 m^3 of a material) This is the definition of charge carrier density	**1**
10	**The only correct answer is D** (The number of conduction electrons increases so the ammeter reading increases) A is not correct because this would be the case if temperature decreased B is not correct because number of conduction electrons increases C is not correct because the ammeter reading increases	**1**
11	**The only correct answer is A** (5 Ω) $r = \frac{R \times (V_{cell} - V_{resistor})}{V_{resistor}} = \frac{10 \times (9-6)}{6}$	**1**
12	**The only correct answer is B** The lattice atoms/ions vibrate with greater amplitude so more frequent collisions with electrons increasing the resistance	**1**
13	**The only correct answer is C** (20.04) $R = 15 + \frac{1}{\left(\frac{1}{7} + \frac{1}{18}\right)} = 20.04\ \Omega$	**1**
14	**The only correct answer is B** (0.018) $P = \frac{V^2}{R} = \frac{1.5}{(20+30)} \times \frac{1.5 \times 20}{(20+30)} = 0.018$ W	**1**
15	**The only correct answer is C** (1.30) $\mathcal{E} = V + Ir = 1.2 + \frac{1.2 \times 0.5}{6} = 1.30$ V	**1**
16	**The only correct answer is C** (negative temperature coefficient thermistor and diode) The resistance of an ohmic conductor remains constant and the resistance of a filament lamp increases with temperature.	**1**
17	**The only correct answer is D** (J C^{-1}) A is not correct because the ampere is the unit of current B is not correct because the joule is a unit of energy C is not correct because the newton is a unit of force	**1**

18	**The only correct answer is D** ($1.39 \times 10^{-4}\ \text{ms}^{-1}$) $v = \frac{I}{neA} = \frac{0.93\ A}{(8.4 \times 10^{28}) \times (1.6 \times 10^{-19}\ \text{C}) \times (5.0 \times 10^{-7}\ \text{m}^2)} = 1.39 \times 10^{-4}\ \text{ms}^{-1}$	**1**
19	**The only correct answer is D** (The y-intercept of the graph is ε) $V = -rI + \mathcal{E}$ compares to y = mx +c where $\mathcal{E}$ is y intercept	**1**
20	**The only correct answer is A** ($\text{J C}^{-2}\ \text{s}$) $R = \frac{V}{I} = \frac{\text{J C}^{-1}}{\text{C s}^{-1}} = \text{J C}^{-2}\ \text{s}$	**1**