

IGCSE Physics 0625 Paper 3 Practice Paper

(Core) - ANSWERS

Total: 80 marks · 1 hour 15 minutes · 6 questions · 33 parts

Part	Answer	Marking points	Marks
1(a)	Average speed = distance / time = $150 / 12 = 12.5$ m/s.	1 mark: correct formula (distance / time). 1 mark: substitution $150 / 12$. 1 mark: answer 12.5 m/s with unit.	3
1(b)	$12.5 \times 3.6 = 45$ km/h.	1 mark: method (multiply by 3.6). 1 mark: value 45. 1 mark: unit km/h.	3
1(c)	Total distance 200 m, total time 80 s, average speed = $200 / 80 = 2.5$ m/s.	1 mark: total distance 200 m. 1 mark: total time 80 s. 1 mark: answer 2.5 m/s.	3
1(d)	0-4 s: $20 / 4 = 5.0$ m/s. 4-10 s: distance does not change, so the car is stationary at a speed of 0.	1 mark: $20 / 4$. 1 mark: 5.0 m/s. 1 mark: stationary between 4 s and 10 s (speed 0).	3
1(e)	The car slows down (negative acceleration / deceleration).	1 mark: speed decreases. 1 mark: opposite to the resultant force / deceleration.	2
2(a)	Density = $240 / 30 = 8.0$ g/cm ³ .	1 mark: $240 / 30$. 1 mark: 8.0 g/cm ³ with unit.	2
2(b)	1 g/cm ³ = 1000 kg/m ³ , so $8.0 \times 1000 = 8000$ kg/m ³ .	1 mark: method, multiply by 1000. 1 mark: value 8000. 1 mark: unit kg/m ³ .	3
2(c)	Volume $5 \times 3 \times 2 = 30$ cm ³ , consistent with (a); weight = $0.24 \text{ kg} \times 10 \text{ N/kg} = 2.4 \text{ N}$; contact area $3 \times 2 = 6$ cm ² ; pressure = $2.4 / 6 = 0.40$ N/cm ² = 4000 Pa.	1 mark: weight 2.4 N. 1 mark: 0.40 N/cm ² . 1 mark: 4000 Pa.	3

2(d)	The pressure decreases. The weight is unchanged but the area increases from 6 cm ² to 15 cm ² (2.5 times larger); pressure = force / area, so pressure becomes $2.4 / 15 = 0.16 \text{ N/cm}^2$ (1600 Pa).	1 mark: pressure decreases. 1 mark: area rises from 6 cm ² to 15 cm ² . 1 mark: 0.16 N/cm^2 or 1600 Pa.	3
2(e)	Pressure = $1000 \times 10 \times 1.5 = 15\,000 \text{ Pa}$.	1 mark: correct substitution into $p = \rho \times g \times h$. 1 mark: 15 000 Pa.	2
3(a)	The energy needed to raise the temperature of 1 kg of a substance by 1 °C.	1 mark: 1 kg of the substance. 1 mark: energy to raise it by 1 °C.	2
3(b)	Temperature change $60 - 20 = 40 \text{ °C}$; energy = $2 \times 4200 \times 40 = 336\,000 \text{ J}$.	1 mark: $\Delta T = 40 \text{ °C}$. 1 mark: substitution into $E = mc \Delta T$. 1 mark: 336 000 J.	3
3(c)	Time = energy / power = $336\,000 / 700 = 480 \text{ s} = 8.0 \text{ minutes}$.	1 mark: method (E / P). 1 mark: 480 s. 1 mark: 8.0 minutes.	3
3(d)	Some energy is lost to the surrounding air and the container, so not all the energy heats the water.	1 mark: energy is lost to the surroundings. 1 mark: not all the energy heats the water.	2
3(e)	The particles vibrate with a larger amplitude, so the average spacing between particles increases and the solid expands.	1 mark: particles vibrate with larger amplitude. 1 mark: average spacing between particles increases.	2
3(f)	Metal is a good conductor, so heat leaves your finger faster than with wood, which makes it feel colder.	1 mark: metal is a good conductor. 1 mark: heat is conducted away from the skin faster.	2
4(a)	Wavelength = speed / frequency = $340 / 500 = 0.68 \text{ m}$.	1 mark: correct formula (v / f). 1 mark: substitution $340 / 500$. 1 mark: 0.68 m.	3
4(b)	Time = $680 / 340 = 2.0 \text{ s}$.	1 mark: substitution $680 / 340$.	2

		1 mark: 2.0 s.	
4(c)	The sound travels there and back, so the one-way distance = $340 \times 0.8 / 2 = 136$ m.	1 mark: recognises the sound travels there and back. 1 mark: $340 \times 0.8 = 272$. 1 mark: 136 m.	3
4(d)	The light slows down and the ray bends towards the normal (refraction).	1 mark: the light slows down. 1 mark: the ray bends towards the normal.	2
4(e)	Frequency is the number of waves (oscillations) per second; the unit is the hertz (Hz).	1 mark: number of waves per second. 1 mark: unit Hz.	2
4(f)	Pitch is determined by frequency and loudness by amplitude.	1 mark: pitch - frequency. 1 mark: loudness - amplitude.	2
5(a)	Resistance in series = $6 + 2 = 8$ ohm.	1 mark: adding the two resistances. 1 mark: 8 ohm.	2
5(b)	Current = voltage / total resistance = $12 / 8 = 1.5$ A.	1 mark: substitution $12 / 8$. 1 mark: 1.5 A.	2
5(c)	6 ohm: $V = IR = 1.5 \times 6 = 9$ V; 2 ohm: $1.5 \times 2 = 3$ V; $9 + 3 = 12$ V, equal to the battery voltage.	1 mark: 9 V. 1 mark: 3 V. 1 mark: check $9 + 3 = 12$ V.	3
5(d)	$1/R = 1/6 + 1/6 = 2/6 = 1/3$, so $R = 3$ ohm.	1 mark: substitution $1/R = 1/6 + 1/6$. 1 mark: 3 ohm.	2
5(e)	A parallel connection provides an extra path for the current, so the total current is larger; since resistance = voltage / current, the equivalent resistance is smaller.	1 mark: an extra path for the current. 1 mark: larger total current gives a smaller resistance.	2
5(f)	Energy = $2 \times 3 = 6$ kWh; cost = $6 \times 1.2 = \$7.20$.	1 mark: 6 kWh. 1 mark: \$7.20.	2
6(a)	The mass number decreases by 4 and the proton (atomic) number decreases by 2.	1 mark: mass number -4. 1 mark: proton number -2.	2
6(b)	$24 / 8 = 3$ half-lives; activity $640 \rightarrow 320 \rightarrow 160 \rightarrow 80$ Bq.	1 mark: 3 half-lives. 1 mark: repeated halving	3

		shown. 1 mark: 80 Bq.	
6(c)	800 → 400 → 200 → 100 is 3 half-lives; $3 \times 6 = 18$ days.	1 mark: recognises 3 half-lives. 1 mark: repeated halving shown. 1 mark: 18 days.	3
6(d)	Alpha particles are charged and relatively massive, so they ionise atoms they collide with easily; each collision uses up energy, so they are absorbed within a few centimetres and penetrate poorly.	1 mark: charged and massive, so strongly ionising. 1 mark: loses energy quickly, so easily absorbed.	2
6(e)	Use long tongs and keep the source as far from the body as possible; a greater distance reduces the radiation dose received.	1 mark: a specific precaution (tongs, distance, lead store). 1 mark: reason (reduces exposure/dose).	2