

Chapter 1 Heat and Temperature. (Revision Questions page 84). Multiple Choice Answers

Q	Ans	Explanation
1	A	Molecules move with a range of speeds and when they collide their speeds change. However, we can only say that molecules of one type have the same average speed at a given temperature.
2	C	The higher the temperature of a substance the greater the average energy of the particles (atoms or molecules). When high energy particles (eg molecules) collide or come in contact with lower energy ones such as when the molecules in a hot liquid contact low energy ones in a cold spoon, there is a sharing or transfer of energy and the high energy ones lose energy and the low energy ones gain energy. Thus, the hot liquid gets cooler, and the cold spoon gets hotter.
3	D	The internal energy (U) is a measure of the microscopic kinetic and potential energy of the particles of the substance. As a substance changes, phase more energy is taken in by the substance so its internal energy increases. So, internal energy increases when it goes from solid to liquid, and again when it goes from liquid to gas.
4	B	There is a sharing of energy in a collision. You may have been shown this in a demonstration of Newton's Cradle where the steel ball coming in stops and makes another ball move away. I love this demo: https://www.youtube.com/watch?v=8dgyPRA86K0&ab_channel=brusspup You will see this again in Chapter 12.2 page 341 when it is described in terms of momentum. Because the temperature of the gas is constant the average speed of the particles must also remain constant.
5	C	This is a trick question (sorry). A temperature of exactly 37°C is 310.5°C ($T_K = T_C + 273 = 37.5 + 273 = 310.5^\circ\text{C}$). The question says the person has to have a temperature of 1°C or more above 37.5°C, so this must be 311.5°C. Answer is (C).

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