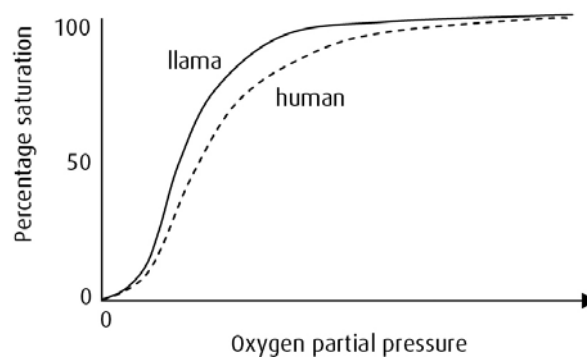


Answers for extension worksheet – Option H

- 1 a** the smell (or sight) of food, the physical presence of food in the stomach (2)
- b i** When food is smelled, impulses pass from the brain to the gastric glands to initiate the release of gastric juices. Contact between the food and the stomach wall stimulates touch receptors, which send sensory signals to the brain. The brain initiates the release of more gastric juice. (2)
- ii** As the walls of the stomach are stretched (distended) by food inside it, the hormone gastrin is released. This hormone ensures that secretion of gastric juices (particularly hydrochloric acid) continues. (2)
- c** A hormone is a chemical messenger, which travels in the bloodstream to specific target cells that respond to it. (2)
- d** An endocrine gland produces hormones that are passed directly into the bloodstream, while an exocrine gland produces secretions that travel along a duct to their point of use. (2)
- e** If osmoreceptors in the hypothalamus detect that the water content of the blood is too low, the posterior pituitary is stimulated to secrete ADH. This affects the collecting ducts in the kidney so that they become more permeable to water, which is absorbed back into the blood. (1)
- If osmoreceptors detect that the water content of the blood is too high, no action potentials are sent to the pituitary, ADH is not secreted and water remains in the collecting ducts and is lost in urine. (1)
- These two processes work together to ensure that the body's water content does not deviate too far from the normal level. Rising levels of water turn on one part of the process, and falling levels turn it off. This is negative feedback. (1)
- 2 a i** The folds, or microvilli, produce a large surface area for absorption. (1)
- ii** Mitochondria are needed for respiration to provide energy for active transport of materials in the cell. (1)
- iii** Tight junctions prevent absorbed food passing between cells and ensure it passes into the bloodstream. (1)
- b** active transport, pinocytosis, facilitated diffusion (3)
- c** the hepatic portal vein, the liver (2)
- d** three from:
cellulose (fibre) from plant cell walls;
lignin (from plant cell walls);
bile pigments
cells from the intestine
bacteria from inside the intestine (3)

- 3 a** The partial pressure of oxygen is the proportion of the total pressure of air (or a mixture of gases) that is due to oxygen. (1)
- b i B**
- ii C**
- iii A**
- iv D** (4)
- c** Additional red blood cells mean that the llama blood contains more hemoglobin and can pick up more oxygen than the blood of an animal without extra red cells. The longevity of the cells means that llamas are less likely to suffer from a shortage if (for example) their diet is inadequate or another factor means that cells cannot be produced. (2)
- d** The curve for llama hemoglobin should be to the left of the curve for human hemoglobin and should resemble that of myoglobin. (2)



- e** High altitude training builds up additional red blood cells, so that when the athlete competes at sea level, he or she has extra oxygen-carrying capacity to supply the muscles. (2)