



Transport: practice questions

5 questions • 18 marks • mark scheme at the back

For IB Diploma Biology SL undefined. **HL only** is additional higher level content, for HL students only.

Name

Total / 18

1 PAPER 1A STYLE [1 mark]

Fenestrated capillaries are found in the glomerulus of the kidney. What is the advantage of fenestrations?

- A. ☐ They prevent blood cells from leaving the capillary
- B. ☐ They allow particularly rapid exchange of fluid and solutes
- C. ☐ They increase blood pressure in the capillary
- D. ☐ They prevent backflow of blood

2 PAPER 2A STYLE [4 marks]

Distinguish between the structure of arteries and veins, relating each difference to function.

3 PAPER 2A STYLE [2 marks]

A student counted her radial pulse for 20 s three times and got 24, 26 and 25 beats. Calculate her mean heart rate in beats per minute and state why she should use her fingertips rather than her thumb.

Answer =

[5 marks]

Saturated fat intake and CHD deaths (practice data)		
Population	Saturated fat / % of energy intake	CHD deaths per 100 000 per year
1	7	60
2	9	95
3	11	140
4	13	150
5	15	230
6	17	240

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[6 marks]

[illegible]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B [1]

2. [4]

- arteries have thicker walls relative to the lumen / veins thinner walls [1]
- artery walls withstand high pressure [1]
- arteries have more elastic fibres which stretch and recoil to maintain pressure/even out flow [1]
- arteries have more smooth muscle to narrow the lumen/maintain pressure [1]
- veins have valves to prevent backflow at low pressure [1]
- veins have wider lumen / flexible walls compressed by skeletal muscle to push blood to heart [1]
- max 4

3. [2]

- mean = 25 beats per 20 s, so $25 \times 3 = 75$ beats per minute [1]
- the thumb has its own pulse, which could be counted by mistake [1]

4. [5]

- (a) positive correlation: as saturated fat intake increases, CHD deaths increase [1]
- (a) strong correlation, as r is close to +1 [1]
- (b) raises blood cholesterol which forms fatty deposits/plaque in coronary artery walls, narrowing lumen [1]
- (b) plaque rupture leads to a blood clot that blocks the artery [1]
- (c) correlation does not prove causation [1]
- (c) other factors could differ between populations, e.g. smoking, exercise, genetics, age / only six populations [1]
- max 5

5. [6]

- water evaporates from (spongy mesophyll) cell walls and diffuses out through stomata [1]
- water drawn from xylem/through cell walls by capillary action/adhesion to cellulose [1]
- generates tension/negative pressure potential in xylem [1]
- tension pulls water up xylem [1]
- cohesion between water molecules due to hydrogen bonding [1]
- keeps a continuous column of water [1]
- adhesion of water to xylem walls [1]
- xylem has no cell contents/end walls so flow is unimpeded [1]
- lignified walls prevent collapse under tension [1]
- pits allow water to enter/leave xylem [1]
- passive process / energy from evaporation (sun), not ATP [1]
- max 6