Full Higher Separate content. ★ = Higher Tier. ◆ = Separate Science only.

Q1. Explain why the left ventricle has thicker walls than the right ventricle.

[2 marks]

Q2. Compare arteries, veins and capillaries in terms of structure and function.

[4 marks]

★ HIGHER TIER

Q3. ★ A patient has heart rate 70 bpm and stroke volume 80 cm³. Calculate cardiac output.

[2 marks]

Total: 8 marks

Q1 (2 marks)

Explain why the left ventricle has thicker walls than the right ventricle.

- Left ventricle pumps blood to the whole body — much longer circuit [1]
- Needs to generate higher pressure — thicker walls contract more forcefully [1]

Q2 (4 marks)

Compare arteries, veins and capillaries in terms of structure and function.

- Arteries: thick elastic walls, small lumen — withstand high pressure from heart [1]
- Veins: valves, large lumen — prevent backflow, low pressure [1]
- Capillaries: one cell thick — minimal diffusion distance for exchange [1]
- Capillaries: dense network — close to every cell [1]

Q3 (2 marks) [★ HT]

★ A patient has heart rate 70 bpm and stroke volume 80 cm³. Calculate cardiac output.

- 70 × 80 = 5600 cm³/min [1]
- = 5.6 dm³/min [1]