**1.** Describe how the conduction system of the heart controls the cardiac cycle.

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

[5]

**1a.** Large amounts of blood need to be circulated around the body during prolonged aerobic exercise.

(i) Identify the mechanisms of venous return that ensure a sufficient supply of blood is returned to the heart during exercise.

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

[4]

(ii) An increase in venous return leads to an increase in heart rate. Explain how this is achieved by intrinsic control.

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

.........................................................................................................................

[4]

**2.** During aerobic exercise the performer requires the heart to pump more blood to the working muscles.

Define stroke volume and give a value for maximal stroke volume during exercise.

Explain how a performer is able to increase stroke volume during exercise.

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

.................................................................................................................................. (5)

**3.** Explain how the cardiac control centre (neural control) increases the heart rate.

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

[4]

**5.** An athlete completes a thirty minute training run.

Describe how hormonal control is used to alter heart rate during the training run.

Describe the mechanisms of venous return that ensure enough blood is returned to the heart during the training run.

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................