Cardio-Respiratory Test System Mark Scheme

1. A

2. C

3. D

4. B

5. Cardiac output is the amount of blood pumped out of the left ventricle of the heart per minute.

6. a. Veins

b. To prevent backflow of the blood

7. Large surface area of alveoli to allow larger volumes of gases / oxygen and carbon dioxide to move between the lungs and the bloodstream (1)

Thin walls / one cell thick creating a short distance for diffusion / short diffusion pathway (1)

Lots of capillaries around the alveoli so large area for gas exchange (1)

Large blood supply to carry gases / oxygen and carbon dioxide (1)

Movement of gas from high concentration to low concentration means there is a pressure gradient which allows diffusion to occur (1)

8. The heart rate, stroke volume and breathing rate increase during exercise (1). The heart rate increases so that blood containing oxygen can be delivered quicker to the working muscles (1). As the amount of oxygen needed at the muscle increases the blood pumps more blood per beat (stroke volume) (1). Due to the increased oxygen demand the breathing rate also increases so that the body can get more oxygen into the blood stream and to the working muscles (1).

9. When we exercise the demand for oxygen to the working muscles increases (1). To provide this the breathing rate increases so that more oxygen can be inhaled (1). However the body can only benefit from this if the heart rate increases to pump the oxygen to the working muscles (1).

10. Red blood cells carry oxygen from the lungs to the muscles (1) and removes carbon dioxide from the muscles to the lungs (1). They contain haemoglobin which bonds with oxygen to form oxyhaemoglobin and without these cells performers would fatigue and stop (1).

11. During aerobic exercise oxygen is used to combine with glucose to create the energy for exercise. Carbon dioxide and water are also produced. Due to the availability of oxygen, aerobic exercise can be maintained for long periods of time at a moderate level (AO1). During a 90 minute match a footballer would primarily work aerobically, running up and down the pitch throughout the match (AO2). The process of aerobic respiration allows the footballer to be able to complete the match at a high level and continue to chase the ball throughout the game, this could lead to a last minute winning goal (AO3).

The other type of respiration is anaerobic respiration. This involves working at a high intensity for short periods of time without oxygen. Whilst energy is created a bi product called lactic acid is produced and can cause fatigue and the muscles to ache (AO1). Activities such as sprinting, jumping and throwing are anaerobic as they are short in duration but high in intensity (AO2). In a game there

would also be times when a footballer would work anaerobically. When sprinting down the wing with the ball a footballer would use anaerobic respiration, however sustaining this throughout the game would be difficult as they would become fatigued and may make an error or be unable to complete the match (AO3).

6 Mark Scheme (OCR Advises):

2 x AO1, 2 x AO2, 2 x AO3, Introduction and Conclusion = 6 marks

2 x AO1, 2 x AO2, 2 x AO3 = 5 marks

2 x AO1, 2 x AO2, 1 x AO3 = 4 marks

2 x AO1, 2 x AO2 = 3 marks

2 x AO1, 1 x AO2 = 2 marks

2 x AO1 or 1 x AO1 and 1 x AO2 = 1 mark

Marks Converted to Grades

9= 25

8= 22-24

7= 20/21

6= 18/19

5= 16/17

4= 14/15

3= 11-13

2= 6-10

1= 1-5