PART C: Extended Answer Question

Please write your answer in the space provided on this sheet. 12 Marks

1. Cellular respiration depends on the delivery of glucose and oxygen to the cells. Oxygen enters the lungs, moves to the alveoli, then to the blood stream and finally to the cells where it drops off the oxygen.

Using dot points, explain the structures and processes which make the lungs well suited to their gas exchange function. Include in your answer a description of the gas exchange process at the alveoli surfaces.

Six points for structures and six points for processes.

Structures

* Alveoli – there are lots of them –increase S.A.
* Alveoli have thin membrane (one cell thick) – small distance for gases to move
* Alveoli are well supplied with blood vessels/capillaries – air and blood in close contact
* Alveoli/Lungs deep inside chest cavity to prevent evaporation from respiratory surfaces
* Respiratory surfaces need to be moist so gases can dissolve.
* Gases need to dissolve so they can diffuse between blood and air

Processes

* Gases move by the process of diffusion:
* For diffusion to occur there needs to be a concentration gradient between the gases in the air in the alveoli and the gases in the blood capillaries around the alveoli
* Concentration gradient is maintained by a constant flow of blood through capillaries around each alveoli
* And, movement of air into and out of alveoli as we breathe in (inhalation) and out (exhalation).
* Pulmonary artery brings deoxygenated blood to the alveoli in the lungs
* Concentration of oxygen in the capillaries around the alveoli is less than the concentration of oxygen in the air of the alveoli
* Concentration gradient determines the oxygen diffuses from air to blood in alveoli – (move from high to low concentration)
* Concentration of carbon dioxide in blood is greater than concentration of carbon dioxide in alveoli air – this creates a concentration gradient
* So, carbon dioxide moves from blood- high concentration, to air in alveoli – low concentration
* Pulmonary vein takes oxygenated blood to the heart to be pumped to the cells of the body – (to carry out cellular respiration)
* Inspiration and expiration only mentioned as a means of maintaining concentration gradient of gases (marks awarded as above) …no marks for describing the processes of inspiration and expiration
* No marks awarded for equation or description of cellular respiration…other than included in point above
* No marks for - Pathway of blood in circulating around the body…except where it is mentioned in points above – between lungs and heart, and heart to cells