**Stage Two Biology: Organisms: Outcome questions / revision**

**O1.** a.) Compare the genetic information from a skin cell and a nerve cell in the same human.

b.) What are the four types of tissues in the human body? How are they different? c.) Name one organ system and its role in the human body. What are the major organs in this system?

**O2.** a.) What is the function of hormones within the body?

b.) What organ system produces hormones to be sent around the body?

c.) What is the function of nerves within the body?

d.) Compare the function of nerves and hormones.

e.) Name the major receptors within the body and how they pass messages to the CNS. What is the difference between the CNS and the PNS?

f.) What is a reflex arc? From a survival perspective explain why reflex arcs are transmitted via nerves rather than hormones.

g.) What is homeostasis? Explain the importance to the human body in maintaining a stable temperature of the internal environment.

h.) Explain how negative feedback helps to maintain a stable blood temperature.

i.) Name the effector that brings about each of the following responses and state whether there would be an increase or decrease in temperature of the internal environment.

(i) Shivering

(ii) Vasodilation

(iii) Hairs lying flat on the skin’s surface

(iv)An increase in the concentration of adrenalin

**O3.** a.) What is meant by an ‘exchange surface’? Name three structures that maximise the exchange.

b.) Why are exchange surfaces thin, moist and have a large surface area?

c.) What substances are exchanged at:

(i) nephron

(ii) alveoli

(iii) villi

d.) How do capillaries in the human body assist in the exchange of materials by diffusion?

e.) State two differences between blood in capillaries and lymph in lymphatic vessels.

f.) What is the difference between veins and arteries and what are their purpose?

g.) Draw the structure of a kidney (rough sketch) and label the important parts. h.) What is the purpose of the kidney? What fluids move in and out of the kidney? i.) What processes occur within the kidney and why do these occur?

j.) What is the nephron and what is its purpose? What is the Bowman’s capsule and what does it do?

k.) What is filtration and where does it occur?

l.) What is reabsorption and where does it occur?

m.) What are the alveoli (singular = alveolus) and what gases are exchanged at this site?

n.) How do these gases move across the membrane? What factors effect the movement of these gases?

o.) Suggest a reason for the body using alveoli instead of having a simple flat surface for the lungs?

p.) What are the villi and what is exchanged at this structure? Where do these materials go?

q.) Decribe the structural elements of the villi and their role in exchanging materials.

**O4.** a.) What is an autotroph? How do they produce energy? What is the word / chemical equation for this process?

b.) How does light intensity, CO2 concentration, temperature and colour of light affect the rate of photosynthesis?

c.) What is a heterotroph? What is a decomposer? What is a parasite?

d.) What are the four important groups of molecules for heterotrophs?

e.) What the source and function of these molecules.  
f.) What is the chemical formula of aerobic respiration? How does this process provide energy to cells? Where is the energy stored and what form does it take?

g.) How is ATP produced and how does ATP release energy for the cell?

h.) What is fermentation and how does it differ from aerobic respiration?

i.) Give an example of an organism that obtains energy through alcohol fermentation. What is the chemical equation? What product is produced that will eventually kill the cell?

j.) Do human cells ever obtain energy through anaerobic respiration? Give an example to support your answer.

k.) What is the chemical formula for lactic acid fermentation? What is the product formed?

l.) Which form of respiration provides the most energy for cells? Why?

m.) Explain the advantage to organisms in developing fermentation to provide energy.

**O5.** a.) Organisms can convert macromolecules into ATP. Where does this occur?

b.) Why do organisms synthesis ATP. Give 4 detailed examples.

**O6 & O7** a.) What does it mean to say that an organism reproduces asexually? Give an example of a plant and animal as part of your answer.

b.) Describe four different methods that plants use to reproduce asexually. Give examples.

c.) Sometimes plant breeders deliberately propagate plants asexually rather than allowing them to reproduce sexually. Why would they do this? Give examples.

d.) Give an example of a somatic mutation which may occur in a body. Is this normally passed on to the next generation? Provide one example of where it could cause a problem.

e.) Suppose a mutation occurred in an egg (or sperm) cell, suggest how this could have quite drastic results for any zygote and baby that may arise from this gamete.

f.) What does sexual reproduction mean? Give an example of one organism that reproduces this way.

g.) What are some advantages / disadvantages of asexual reproduction?

h.) What are some advantages / disadvantages of sexual reproduction?

i.) Where does the process of meiosis fit into sexual reproduction? Where does it occur?

j.) Explain what it means to say that gametes are haploid, whereas organisms are usually diploid.

k.) What are homologous pairs?

l.) Describe what is meant by the locus of a gene? Does this change between individuals of a species? Does this vary between species?

m.) What is meant by the term allele?

n.) Draw diagrams to explain the terms crossing over and independent assortment. Why are these processes important during meiosis?

o.) If gametes are haploid how does the diploid number get restored for an offspring?

**O8 & O9.** a.) Variations in humans occurs in 4 different ways. Describe them.

b.) What is the theory of natural selection? Howdoes a species change physical characteristics over time?

**O10.** a.)Give an example of genetic engineering. What are the benefits? What are the negative impacts?

b.) What is meant by the term bioethics and how is it linked to genetic engineering.