**Year 11 Biology Semester One Exam 2010 (Answers)**

**Multiple Choice Section**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| **B** | **D** | **D** | **B** | **B** | **D** | **B** | **D** | **C** | **B** | **D** | **D** | **C** | **C** | **A** | **C** | **D** | **A** | **D** | **D** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** |
| **B** | **A** | **B** | **B** | **D** | **D** | **A** | **B** | **C** | **B** | **C** | **B** | **B** | **C** | **C** | **C** | **B** | **C** | **D** | **D** |

|  |  |  |  |  |
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| **41** | **42** | **43** | **44** | **45** |
| **A** | **B** | **C** | **B** | **C** |

Short answer Section

Question 1.

a. J – phospholipid bilayer (1).

K– protein channel, courier protein (1).

b. Any one of (1).

• Active transport requires energy/ATP.

• Active transport moves substances against a concentration gradient.

c. i. Phospholipid bilayer (1).

ii. Diffusion (1).

iii. Aerobic Respiration (1).

iv. Glucose + Oxygen → Carbon Dioxide + Water + Energy/ATP (2).

*(1 mark for reactants, 1 mark for products)*

Question 2.

a. i. chloroplasts (1).

ii. photosynthesis (1).

Chlorophyll, Light

iii. Carbon Dioxide + Water Glucose + Oxygen (2).

*(1 mark for reactants, 1 mark for products)*

b. Greater absorption of light for photosynthesis (1).

Question 3.

a.

|  |  |  |  |
| --- | --- | --- | --- |
| **Organic Compound** | **Elements Present** | **Example** | **Role in Cell**  **Structure/Function** |
| **Carbohydrates** | Carbon, Hydrogen, Oxygen ( ½ ) | One of: Cellulose/Starch/Glucose/Sucrose  Glycogen etc. ( ½ ) | Example:  Cellulose- Structural support in Cell wall ( ½ ) |
| **Proteins** | Carbon, Hydrogen, Oxygen, Nitrogen, Sulphur ( ½ ) | One of:  Enzyme, Keratin, Insulin etc.  ( ½ ) | Example:  Enzymes- Speed up the rate of chemical reactions ( ½ ) |
| **Lipids** | Carbon, Hydrogen, Oxygen ( ½ ) | Phospholipids, Cholesterol, Triglyceride etc. ( ½ ) | Example:  Cholesterol- Provides fluidity to the cell membrane ( ½ ) |
| **Nucleic Acids** | Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus ( ½ ) | DNA or RNA ( ½ ) | Example:  DNA- carries information for building proteins ( ½ ) |

b.

|  |  |  |
| --- | --- | --- |
| **Process** | **Input** | **Output** |
| **Photosynthesis** | Carbon Dioxide, Water ( ½ ) | Glucose, Oxygen ( ½ ) |
| **Aerobic Respiration** | Glucose, Oxygen ( ½ ) | Carbon Dioxide, Water ( ½ ) |
| **Anaerobic Respiration in Plants** | Glucose ( ½ ) | Carbon Dioxide and Alcohol  ( ½ ) |
| **Anaerobic Respiration in Animals** | Glucose ( ½ ) | Lactic Acid ( ½ ) |

Question 4.

a. A – Upper Epidermis ( ½ )

B – Palisade Mesophyll ( ½ )

C – Spongy Mesophyll ( ½ )

D – Waxy Cuticle ( ½ )

b. Part A functions as a protective layer OR secretes waxy cuticle (1).

c. Stomata would be exposed to more heat if they were on the upper surface of the leaf (1). This would cause them to lose a greater amount of water (1).

d. Any TWO of the following (2).

\* Leaf could have fewer stomata

\* Leaf could have reduced airspaces

\* Leaf could have lower surface area

\* Leaves could be fleshier

\* Waxy cuticle could be thicker

\* Stomata of leaves might have an inverted stomatal rhythm

\* Leaf may have sunken stomata

\* Any other reasonable suggestion

Question 5.

a. Cellulase (1).

b. The Termites benefit as the protozoans chemically digest the wood which the termites are unable to do (1).

c. Mutualism (1).

d. Yes ( ½ ) since they possess flagella/cilia ( ½ ).

Question 6.

a. All marsupials are heterotrophs since they obtain organic matter by eating other organisms (1).

b. i. A – Stomach (1).

ii. B – Small Intestine (1).

iii. C – Caecum (1).

c. Ringtail possums are fermenters since they have a large region in their digestive tract where anaerobic bacteria breakdown plant matter (1). They are hindgut fermenters since the area where this occurs is after the small intestine (1).

d. Any two of the following (2).

\* Pellets released during the day would contain higher amounts of glucose than those

released at night.

\* Pellets released during the day would contain higher amounts of amino acids than those

released at night.

\* Pellets released during the day would contain higher amounts of vitamins than those

released at night.

\* Pellets released during the day would contain higher amounts of minerals than those

released at night.

\* Pellets released during the day would contain higher amounts of fatty acids than those

released at night.

\* Pellets released during the day would contain higher amounts of water than those

released at night.

\* Any other reasonable suggestion.

e. Any two of the following (2).

\* Ringtail possums are likely to lack canines on the upper Or lower jaw Or both jaws.

\* Ringtail possums are likely to have a diastema.

\* The molar teeth of ringtail possums are likely to be suited to grinding.

Question 7.

a. Plant OR Example of a plant (1).

b. The structure would come from a eukaryotic organism ( ½ ) since the cells contain membrane-bound organelles ( ½ ).

c. On a hot and dry day the guard cells would become flaccid and the pore (stoma) would close (1).

d. The organism would produce organic matter at a reduced rate (1) since most of the carbon dioxide that it uses in photosynthesis would normally enter through the open stomata (1).

Question 8.

a. Molecule 2 ( ½ ) since it has the best shape to fit into the active site of the enzyme ( ½ ).

b. The activity of the enzyme would decrease ( ½ ), as at lower temperatures the enzyme and substrate molecules will be moving at a slower speed ( ½ ).

Question 9.

The following four points should be made.

* Transplant some of the blue hydrangeas from the acidic soil into the alkaline soil and some pink flowers from the alkaline soil into the acidic soil (1).
* Keep all other factors constant (1).
* Let the Hydrangeas flower and record the colours in each of the two soil types (1).
* The results support the hypothesis if the Hydrangeas that were previously producing blue flowers now produce pink flowers and the Hydrangeas that were previously producing pink flowers now produce blue flowers (1).