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IB Biology SL Paper 1 Question Bank

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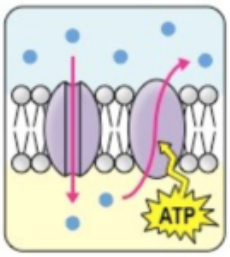
1. The diagram is a model of one type of membrane protein function.



What is this type of membrane protein function?
A. Enzymatic activity
B. Active/Passive transport
C. Cell-to-cell recognition
D. Anchorage/Attachment

Solution: B
Explanation: Membrane proteins can serve a variety of key functions. The function outlined in the diagram is transport. Transport is responsible for facilitated diffusion and active transport.

2. There are four main types of stem cells present at various stages of human development, which type describes multipotent cells?

A. Multipotent cells form any cell type, as well as extra-embryonic (placental) tissue (e.g. zygote)
B. Multipotent cells form any cell type (e.g. embryonic stem cells)
C. Multipotent cells can differentiate into a number of closely related cell types (e.g. haematopoietic adult stem cells)
D. Multipotent cells can not differentiate but are capable of self-renewal (e.g. progenitor cells, muscle stem cells)

Solution: C
Explanation: Multipotent cells can differentiate into a number of closely related cell types (e.g. haematopoietic adult stem cells)

3. What is the concentration, in mol dm−3, of 30.0 g of NaOH (Mr = 40.0) in 150.0 cm3?

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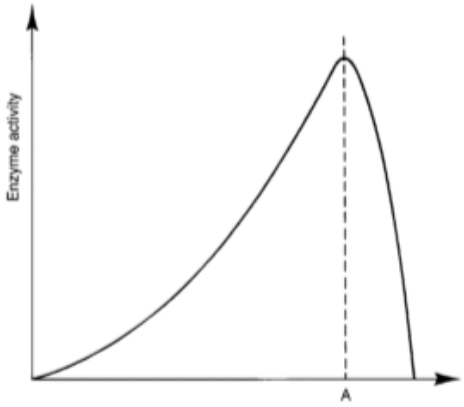

A. **The Effect of Temperature on Enzyme Activity**
B. The Effect of pH on Enzyme Activity
C. The Effect of Substrate Concentration on Enzyme Activity
D. The Effect of Salinity on Enzyme Activity

Solution: A
Explanation: Low temperatures result in insufficient thermal energy for the activation of an enzyme-catalysed reaction to proceed. Increasing the temperature will increase the speed and motion of both enzyme and substrate, resulting in higher enzyme activity. High temperatures cause denaturation.

4. In decreasing order, which greenhouse gases have the largest warming effect within the atmosphere?

A. Water vapour, carbon dioxide, methane, nitrogen oxides
B. Carbon dioxide, methane, nitrogen oxides, water vapour
C. Methane, carbon dioxide, water vapour, nitrogen oxides
D. Nitrogen oxides, methane, carbon dioxide, water vapour

Solution: A
Explanation: The greenhouse gases which have the largest warming effect within the atmosphere are water vapour (clouds) and carbon dioxide.

5. Which animal phyla is matched to the correct description?

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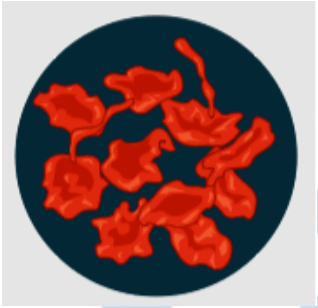
A. Arthropoda	animal phyla; sponges, marine, sessile (stationary), no mouths or digestive tracts, filter out food, no organs
B. Annelida	animal phyla; spiders and insects, hard exoskeleton made of chitin, segmented, limbs that bend
C. Cnidaria	animal phyla; jellyfish/hydra. nemacyts: stinging cells, some sessile, some swim, catch food w tentacles, gastric pouch, carried by current or swim
D. Platyhelminthes	animal phyla; segmented worms, bodies divided into sections w rings, bristles

Solution: Cnidaria

6. The image shows a red blood cell that has been placed in a solution.



What type of solution is surrounding the red blood cell?
A. Hypertonic
B. Isotonic
C. Hypotonic
D. Osmotic

Solution: A
Explanation: In hypertonic solutions, water will leave the cell causing it to shrivel (crenation).

7. What type of bond holds the complementary base pairs together in a double helix of DNA?

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A. covalent bonds
B. peptide bonds
C. glycosidic bonds
D. hydrogen bonds

Solution: D
Explanation: The two strands are held together by hydrogen bonds between pairs of bases: adenine pairs with thymine, and cytosine pairs with guanine.

8. Which of the following is responsible for the red colour in blood?

A. **Myoglobin**
B. Hemocyanin
C. Haemoglobin
D. Platelets

Solution: C
Explanation: Haemoglobin is the protein found in the red blood cells, it primarily functions in the transport of oxygen and carbon dioxide. It renders red colour to the blood.

9. What is the lifespan of WBCs?

A. Between 10-20 days
B. Between 20-30 days
C. Between 2-3 months
D. Less than 10 days

Solution: B
Explanation: The lifespan of white blood cells varies between 20-30 days.

10. What is the lifespan of RBCs?

A. 60 days
B. 100 days
C. 120 days
D. 40 days

Solution: C
Explanation: The maximum lifespan of RBCs is 120 days.

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