



22116007



International Baccalaureate®  
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**BIOLOGY  
HIGHER LEVEL  
PAPER 1**

Wednesday 18 May 2011 (afternoon)

1 hour

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**INSTRUCTIONS TO CANDIDATES**

- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.

1. The table below shows the level of hemoglobin measured in two different groups of athletes.

	<b>Hemoglobin / grams per 100 cm<sup>3</sup></b>	<b>Number of athletes tested</b>	<b>Standard deviation / grams per 100 cm<sup>3</sup></b>
<b>Group A</b>	12.6	200	0.8
<b>Group B</b>	11.9	220	3.2

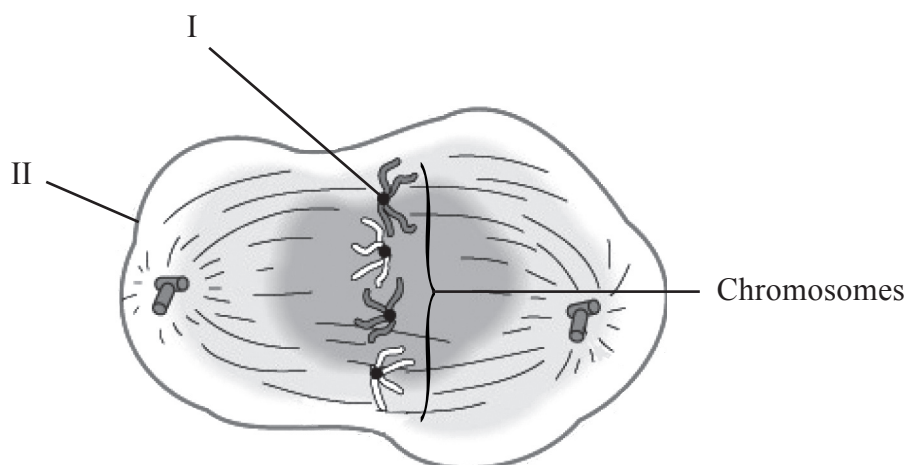
Which of the following statements is correct?

- A. Results from group B are more accurate because more athletes were tested.
- B. Results from group B are more reliable because it has a higher standard deviation.
- C. More athletes have their hemoglobin concentration close to the mean in group A than in group B.
- D. These results indicate that the level of hemoglobin follows a normal distribution.
2. A red blood cell is 8  $\mu\text{m}$  in diameter. If drawn 100 times larger than its actual size, what diameter will the drawing be in mm?
- A. 0.08 mm
- B. 0.8 mm
- C. 8 mm
- D. 80 mm
3. An unknown cell is observed using a microscope. A cell wall, ribosomes and DNA are identified. What can be concluded from these observations?
- A. It can only be a prokaryotic cell.
- B. It can only be a eukaryotic cell.
- C. It could be a prokaryotic or eukaryotic cell.
- D. It can only be a plant cell.

4. Which pair of features is correct for both diffusion and osmosis?

	<b>Diffusion</b>	<b>Osmosis</b>
A.	net movement of particles from high to low concentration	active transport of water across a partially permeable membrane
B.	net movement of particles from low to high concentration	active transport of water across a partially permeable membrane
C.	net movement of particles from low to high concentration	passive movement of water across a partially permeable membrane
D.	net movement of particles from high to low concentration	passive movement of water across a partially permeable membrane

5. The diagram below shows a cell during mitosis.

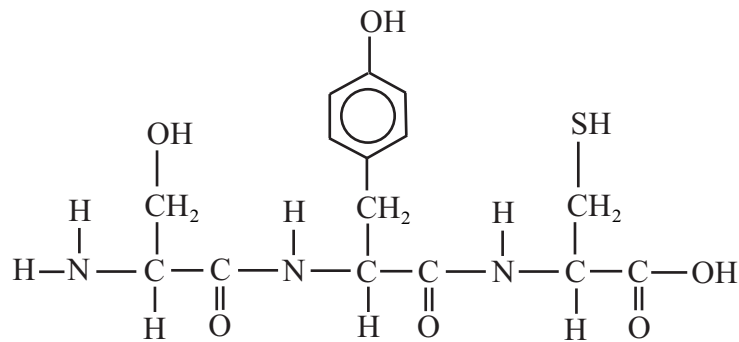


What are the structures and stage of mitosis?

	<b>Stage of mitosis</b>	<b>Structure I</b>	<b>Structure II</b>
A.	metaphase	chromatid	nuclear membrane
B.	anaphase	centromere	plasma membrane
C.	anaphase	chromatid	nuclear membrane
D.	metaphase	centromere	plasma membrane

6. Which statement about water is correct?
- A. The atoms within a molecule of water are held together by hydrogen bonds.
  - B. Water has a low heat capacity allowing enzymatic reactions to happen at a wide range of temperatures.
  - C. Water molecules are polar, therefore fatty acids do not dissolve.
  - D. Ice has a higher density than liquid water, therefore some organisms can live under the ice.

7. Which type of molecule is shown in the diagram below?



- A. Peptide
  - B. Carbohydrate
  - C. Lipid
  - D. Nucleic acid
8. The percentage of thymine in the DNA of an organism is approximately 30%. What is the percentage of guanine?
- A. 70%
  - B. 30%
  - C. 40%
  - D. 20%

9. Which of the following are involved in **both** replication and transcription?
- A. DNA only
  - B. DNA and RNA
  - C. DNA and ribosomes
  - D. DNA, RNA and ribosomes
10. What is the source of the oxygen released into the air as a product of photosynthesis?
- A. Chlorophyll
  - B. Carbon dioxide only
  - C. Water only
  - D. Both water and carbon dioxide
11. What is the difference between the alleles of a gene?
- A. Their position on the chromosome
  - B. Their amino acid sequence
  - C. Their pentose sugars
  - D. Their base sequence
12. Which of the following statements about homologous chromosomes is correct?
- A. Each gene is at the same locus on both chromosomes.
  - B. They are two identical copies of a parent chromosome which are attached to one another at the centromere.
  - C. They always produce identical phenotypes.
  - D. They are chromosomes that have identical genes and alleles.