



**BIOLOGY  
STANDARD LEVEL  
PAPER 1**

Monday 17 November 2008 (afternoon)

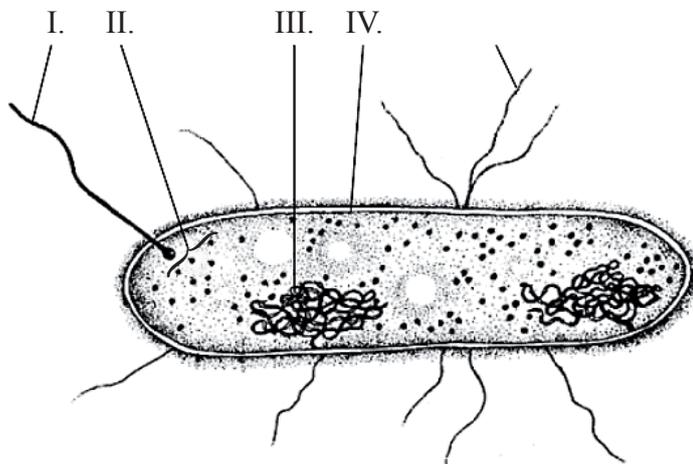
45 minutes

---

**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. Which of the following characterizes tissues?
  - A. A group of cells that develop independently.
  - B. A group of organs that have the same function.
  - C. A group of cells that have the same function.
  - D. A group of organs that have the same structure.
  
2. Which of the following explains how brain cells develop to carry out their functions?
  - A. The cells have interacted to become brain cells.
  - B. The cells have evolved that way.
  - C. Some genes are expressed while other genes are not.
  - D. All genes are expressed in the brain cells.
  
3. The following is a diagram of a prokaryote.

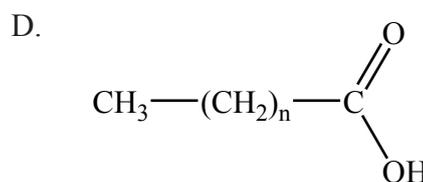
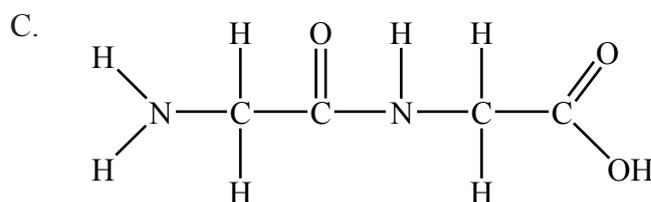
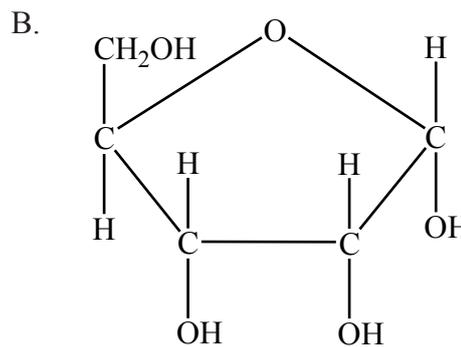
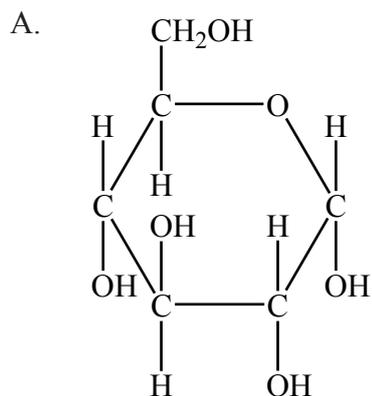


Which **two** structures are required for protein synthesis in this cell?

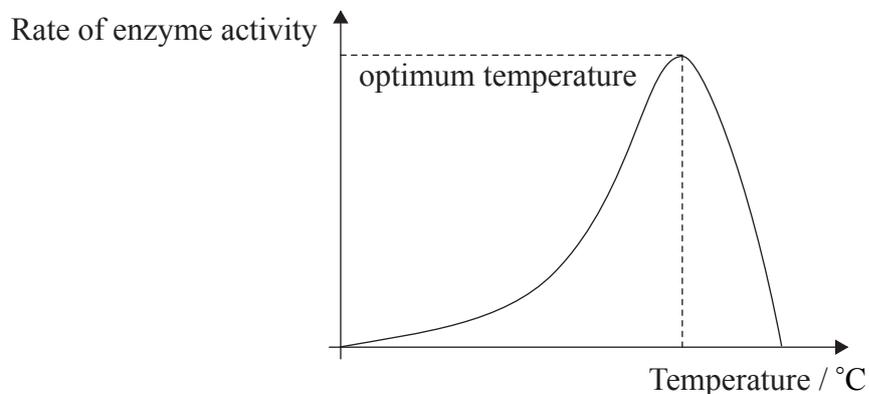
- A. III and IV
- B. II and IV
- C. II and III
- D. I and II

4. What is necessary for osmosis to occur?
- A. A membrane protein
  - B. A partially permeable membrane
  - C. A source of energy
  - D. A cell wall
5. In a cell the nuclear membrane has broken down and spindle microtubules from both poles are attached to each centromere of chromosomes aligned on the equator. Which phase of mitosis does this describe?
- A. Prophase
  - B. Anaphase
  - C. Metaphase
  - D. Telophase
6. Which of the following contain the element phosphorus?
- A. Amino acids
  - B. Viruses
  - C. Ribose
  - D. Deoxyribose

7. Which diagram correctly illustrates a glucose molecule?



8. The following diagram shows the effect of temperature on enzyme activity. What explains the lack of activity at high temperatures?



- A. The active site no longer has the required shape.
- B. All the substrate has been used.
- C. All the enzyme has been used.
- D. The active site is completely filled with substrate.

9. Which of the following correctly show the process and location for pyruvate formation?

	<b>Process</b>	<b>Location</b>
A.	aerobic cell respiration	cytoplasm
B.	respiration	chloroplast
C.	photosynthesis	cytoplasm
D.	photosynthesis	chloroplast

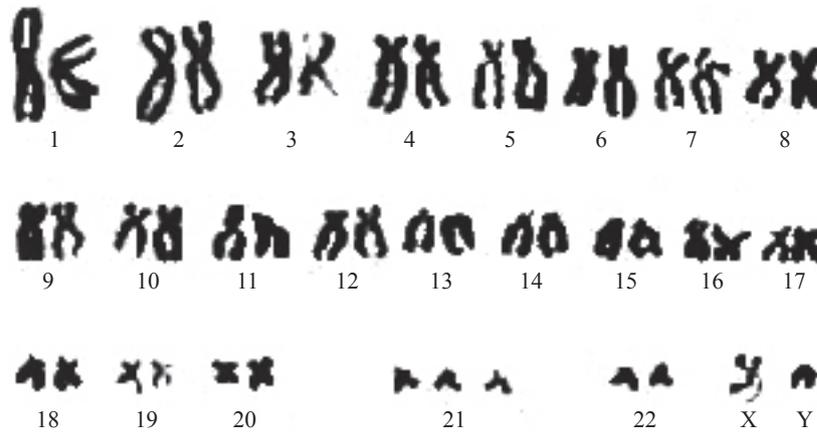
10. A molecule has two guanines, one cytosine, three riboses and three phosphates arranged in a single strand. What kind of molecule is this?

- A. DNA
- B. RNA
- C. A triplet of DNA nucleotides
- D. A polysaccharide

11. In photosynthesis, light energy is used to split water molecules. Which products are formed and what is the name of the reaction?

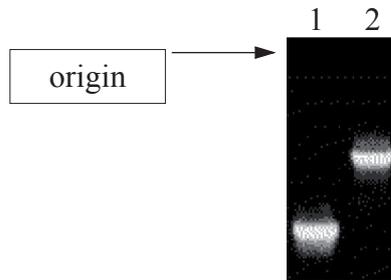
	<b>Products formed</b>	<b>Reaction</b>
A.	hydrogen and ATP	photolysis
B.	hydrogen and oxygen	photolysis
C.	hydrogen and ATP	hydrolysis
D.	hydrogen and oxygen	hydrolysis

12. What can be concluded from the following data?



- A. Karyotype of a male with a normal set of chromosomes
  - B. DNA profiling of a male with Down syndrome
  - C. DNA profiling of a male with a normal set of chromosomes
  - D. Karyotype of a male with Down syndrome
13. The genotypes of two parents are  $Hb^A Hb^A$  and  $Hb^A Hb^S$ . What are the likely phenotypes of their children?
- A. 75% healthy
  - B. 50% may develop sickle-cell anemia
  - C. 25% may develop sickle-cell anemia
  - D. 100% healthy

14. The gel image shown below has two lanes. The DNA is loaded onto the gel at the origin. To separate the DNA fragments a negative charge is applied to the origin of the gel. What conclusion could be made about the DNA fragments?

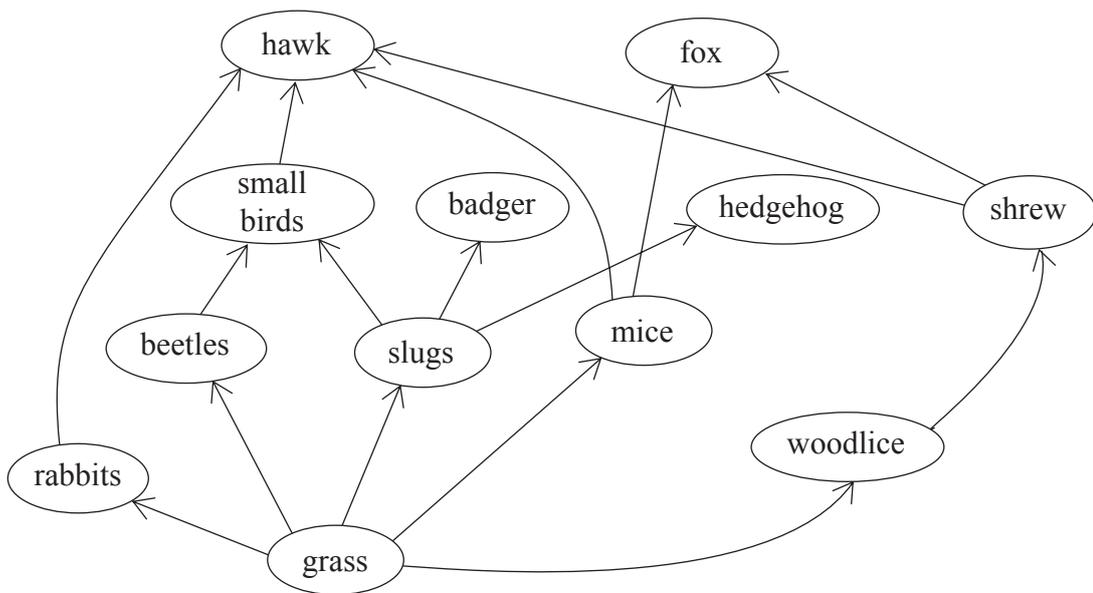


- A. The size of the DNA fragment in Lane 1 is greater than in Lane 2.
  - B. The charge of the DNA fragment in Lane 2 is positive.
  - C. The size of the DNA fragment in Lane 2 is greater than in Lane 1.
  - D. The charge of the DNA fragment in Lane 1 is positive.
15. Which of the following best describes sex linkage?
- A. The condition will be inherited only by sons.
  - B. The condition will be inherited only by daughters.
  - C. The condition may be inherited by sons and daughters.
  - D. The condition will be inherited by more daughters than sons.
16. A human gene is cloned into a plasmid and put into a host cell. Which enzymes are used for this gene transfer?
- A. Restriction endonuclease and DNA ligase
  - B. DNA polymerase and DNA ligase
  - C. Restriction endonuclease and DNA polymerase
  - D. DNA polymerase and RNA polymerase

17. Which of the following best describe(s) all the descendants of a clone?

- I. They have the same chromosomes.
  - II. They share one parent.
  - III. They are sterile.
- A. I only
  - B. I and II only
  - C. I and III only
  - D. I, II and III

The following diagram of a food web refers to questions 18 and 19.



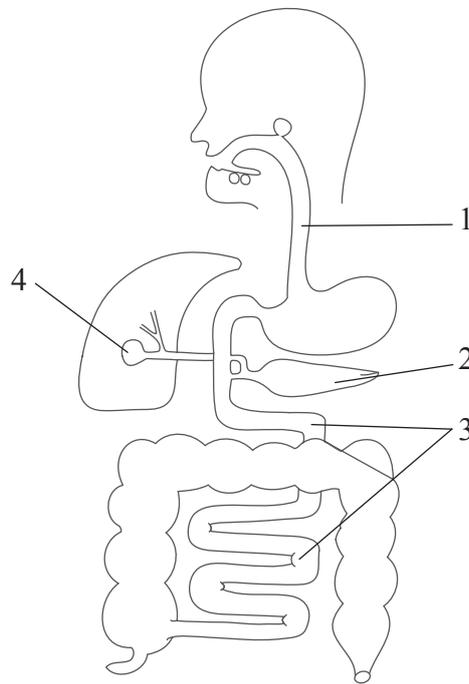
18. Which organism(s) in the food web above is(are) both secondary consumer(s) and tertiary consumer(s)?

- A. Hawk and fox
- B. Hawk and hedgehog
- C. Fox and badger
- D. Hawk only

19. If  $1\,000\,000\text{ J m}^{-2}\text{ yr}^{-1}$  of sunlight is assimilated by the grass in the food web, how much energy would be available to the badger?
- A. 10 to  $25\text{ J m}^{-2}\text{ yr}^{-1}$
  - B. 100 to  $200\text{ J m}^{-2}\text{ yr}^{-1}$
  - C. 500 to  $1000\text{ J m}^{-2}\text{ yr}^{-1}$
  - D. 2500 to  $10\,000\text{ J m}^{-2}\text{ yr}^{-1}$
20. The average weight of walnuts from one group of trees was 8.5 g with a standard deviation of 1.5 g. Which conclusion can be drawn from these data?
- A. 95% of all walnuts from these trees weigh between 5.5 g and 11.5 g.
  - B. 68% of all walnuts from these trees weigh between 5.5 g and 11.5 g.
  - C. The minimum weight of walnuts from this tree is 5.5 g.
  - D. The maximum weight of walnuts from this tree is 11.5 g.
21. Which of the following gases contribute to the greenhouse effect?
- I. Methane
  - II. Water vapour
  - III. Nitrogen
- A. I only
  - B. I and II only
  - C. II and III only
  - D. I, II and III

22. What is the main cause of variation in a species?
- A. Meiosis
  - B. Mitosis
  - C. Random mating
  - D. Emigration

23. The diagram below represents the human digestive system.

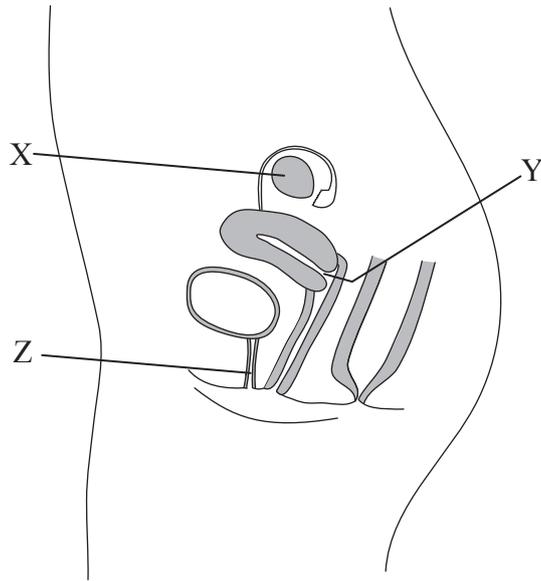


Which of the following correctly represents the labels?

	<b>Esophagus</b>	<b>Gall bladder</b>	<b>Small intestine</b>	<b>Pancreas</b>
A.	1	4	2	3
B.	1	4	3	2
C.	4	3	1	2
D.	2	1	3	4

24. What type of blood does the left atrium of the heart receive?
- A. Deoxygenated blood from the lungs
  - B. Oxygenated blood from the right ventricle
  - C. Oxygenated blood from the lungs
  - D. Deoxygenated blood from the left ventricle
25. What will be an effect of HIV infection on the immune system?
- A. Antigens no longer bind to antibodies.
  - B. Number of active lymphocytes is increased.
  - C. Antibody production is limited.
  - D. HIV patient will fall ill more frequently.
26. A person is suffering from an illness and the doctor prescribes an antibiotic to treat the disease. What is the patient likely to suffer from?
- A. A viral infection
  - B. A prokaryotic infection
  - C. An eukaryotic infection
  - D. The flu (influenza)

27. The diagram below shows the female reproductive system and associated organs.



Which of the labelled structures correctly identify the cervix, urethra and ovary?

	<b>Cervix</b>	<b>Urethra</b>	<b>Ovary</b>
A.	Z	X	Y
B.	Y	Z	X
C.	Y	X	Z
D.	Z	Y	X

28. Which conditions apply to gas exchange in the lungs when the blood arrives there from the body?

	<b>Blood oxygen concentration</b>	<b>Blood carbon dioxide concentration</b>
A.	same as inhaled air	higher than inhaled air
B.	higher than inhaled air	lower than inhaled air
C.	lower than inhaled air	higher than inhaled air
D.	same as inhaled air	lower than inhaled air

- 29.** Which of the following events leading up to birth is correct?
- A. Progesterone levels increase, oxytocin decreases.
  - B. Progesterone levels decrease, oxytocin increases.
  - C. Progesterone levels increase, oxytocin increases.
  - D. Progesterone levels decrease, oxytocin decreases.
- 30.** What should happen after a meal?
- A. Blood glucose concentration rises and insulin concentration increases.
  - B. Blood glucose concentration decreases and glucagon increases.
  - C. Blood glucose concentration rises and insulin concentration decreases.
  - D. Blood glucose concentration rises and glucagon concentration stays the same.
-