M08/4/BIOLO/SPM/ENG/TZ1/XX

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BIOLOGY
STANDARD LEVEL
PAPER 1

Wednesday 14 May 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. What describes tissues?

A. Groups of cells that develop the same way with the same function

B. Groups of cells that develop the same way with different functions

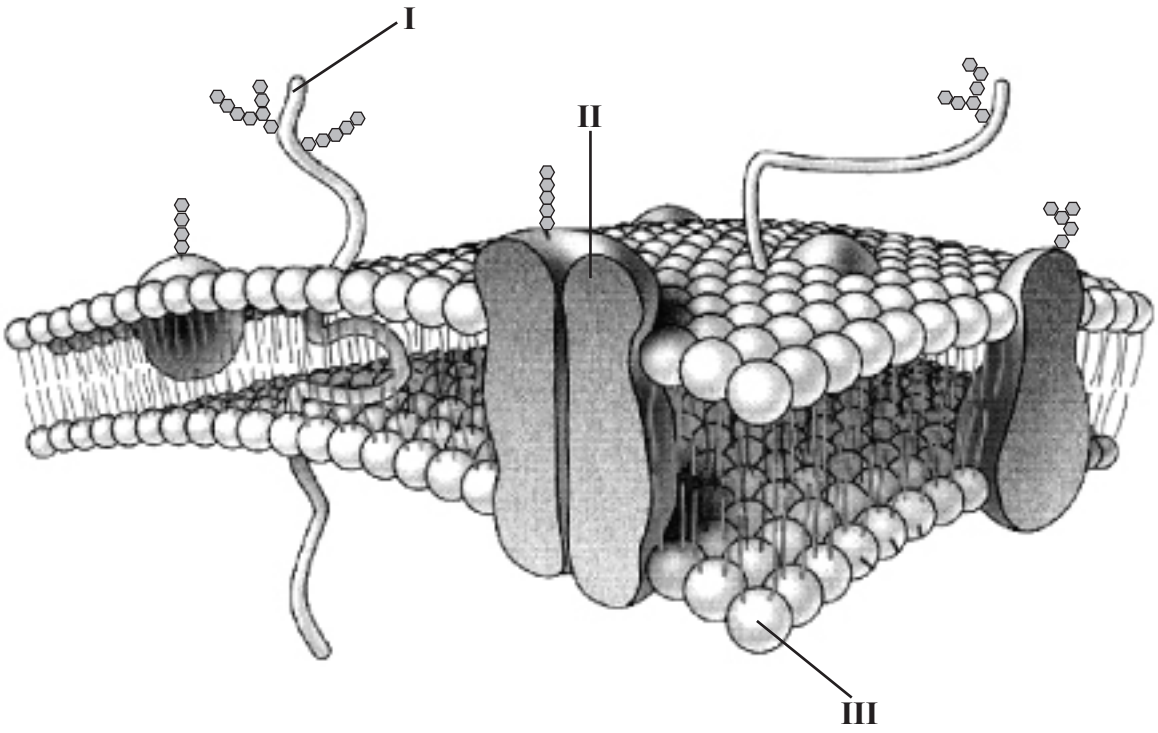
C. Groups of cells that have combined to form a structure

D. Groups of cells that have combined to form one organ

2. Which pair of features is correct for both plant and prokaryotic cells?

	Plant cell	**Prokaryotic cell**
A.	Able to change shape	Fixed shape
B.	Contains DNA associated with protein	Contains naked DNA
C.	DNA enclosed by membrane	DNA associated with protein
D.	Chloroplasts may be present	Chloroplasts may be present

3. The diagram shows a model of a biological membrane. What do labels I, II, and III illustrate?



	I	II	III
A.	Integral protein	Peripheral protein	Hydrophobic phosphate head
B.	Peripheral protein	Glycoprotein	Hydrophilic phosphate head
C.	Glycoprotein	Integral protein	Hydrophilic phosphate head
D.	Glycoprotein	Peripheral protein	Hydrophobic phosphate head

4. What describes the functions of the following organelles?

	Golgi apparatus	Rough endoplasmatic reticulum
A.	Synthesis of proteins for cell secretion	ATP production
B.	ATP production	Synthesis of proteins for cell secretion
C.	Synthesis of proteins for cell secretion	Processing of proteins
D.	Processing of proteins	Synthesis of proteins for cell secretion

5. What are components of viruses?

I. Nucleic acid
II. Protein
III. Lysosome

A. I only

B. I and II only

C. I and III only

D. II and III only

6. What role does iron play in living organisms?

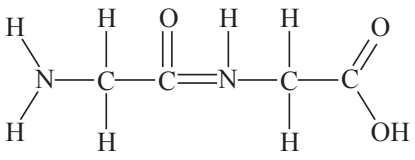
A. As a component in nucleic acids

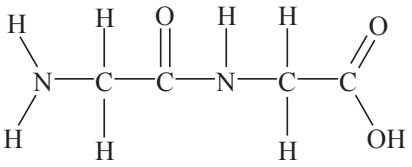
B. As a component of lipids

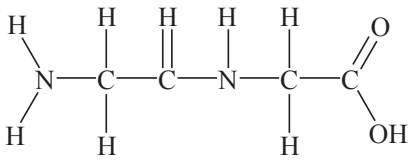
C. As a component of carbohydrates

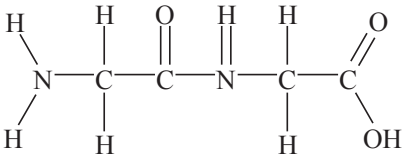
D. As a component of proteins

7. Which diagram correctly illustrates a dipeptide?

A. 

B. 

C. 

D. 

8. What are the components of a DNA nucleotide?

A. deoxyribose, a phosphate and one of the bases: adenine, cytosine, guanine or thymine

B. ribose, a phosphate and one of the bases: adenine, cytosine, guanine or uracil

C. deoxyribose, a nitrate and one of the bases: adenine, cytosine, guanine or thymine

D. ribose, a nitrate and one of the bases: adenine, cytosine, guanine or thymine

9. What is the correct sequence of chemicals produced in the anaerobic respiration pathway?

A. lactate → pyruvate → ethanol

B. ethanol → pyruvate → glucose

C. glucose → lactate → pyruvate

D. glucose → pyruvate → lactate

10. Why do leaves of plants look green?

A. Most of the green light is absorbed by chlorophyll and most of the red and blue light is reflected.

B. Most of the blue light is absorbed by chlorophyll and most of the red and green light is reflected.

C. Most of the red light is absorbed by chlorophyll and most of the green and blue light is reflected.

D. Most of the red and blue light is absorbed by chlorophyll and most of the green light is reflected.

11. How would the following DNA sequence, ACGTTGCATGGCA, be transcribed?

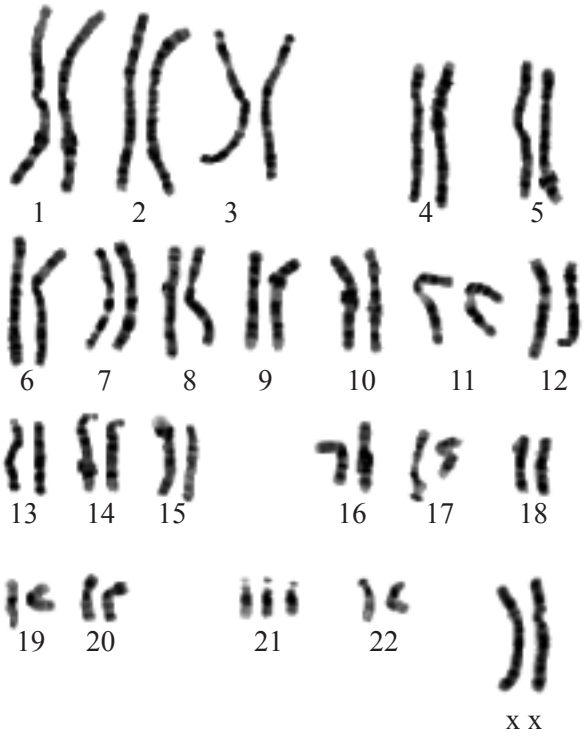
A. UGCAACGUACCGU

B. TGCAACGTACCGT

C. ACGTTGCATGGCA

D. ACGUUGCAUGGCA

12. What can be concluded on the basis of the following karyotype?



A. Female with a normal set of chromosomes

B. Male with Down syndrome

C. Female with Down syndrome

D. Male with a normal set of chromosomes

13. What are homologous chromosomes?

A. Two chromosomes with differing sets of genes, in the same sequence, with the same alleles

B. Two chromosomes with the same set of genes, in a different sequence, with the same alleles

C. Two chromosomes with a different set of genes, in the same sequence, with different alleles

D. Two chromosomes with the same set of genes, in the same sequence, sometimes with different alleles

14. Which features of DNA fragments are used to separate them in the process of gel electrophoresis?

A. Their charge and their size

B. Their charge and base composition

C. The sequence of their bases and their charge

D. Their base composition and their size

15. Which feature of a genetic pedigree chart demonstrates that a characteristic is sex linked?

A. Numbers of offspring carrying the characteristic decreased over several generations.

B. One gender is more commonly affected than the other.

C. Equal numbers of males and females inherit the characteristic.

D. Boys and girls only inherit the characteristic from their mothers.

16. What does the genotype $X^H X^h$ indicate?

A. A co-dominant female

B. A heterozygous male

C. A heterozygous female

D. A co-dominant male

17. If a purple flowered (Pp) and a white flowered pea plant (pp) are crossed, what will the offspring be?

A. 1 : 1 ratio of purple and white flowers

B. 3 : 1 ratio of purple to white flowers

C. 1 : 3 ratio of purple to white flowers

D. All purple flowers

18. What is a *community*?

A. A group of producers and consumers living and interacting in an area.

B. A group of species living and interacting in an area.

C. A group of organisms living and interacting in an area.

D. A group of populations living and interacting in an area.

19. What are the main sources of carbon dioxide on earth?

A. cellular respiration of consumers, producers and combustion of fossil fuels

B. photosynthesis and cellular respiration of consumers

C. cellular respiration of producers and combustion of fossil fuels

D. photosynthesis and combustion of fossil fuels

20. The average leaf length of one plant is 2.5 cm with a standard deviation of 0.5 cm. What does this indicate?

A. 95 % of all leaves fall within the ranges of 2.0 to 3.0 cm

B. 68 % of all leaves fall within the ranges of 1.5 to 3.5 cm

C. 68 % of all leaves fall within the ranges of 2.5 to 3.0 cm

D. 95 % of all leaves fall within the ranges of 1.5 to 3.5 cm

21. What are *Allium sativa* and *Allium cepa*?

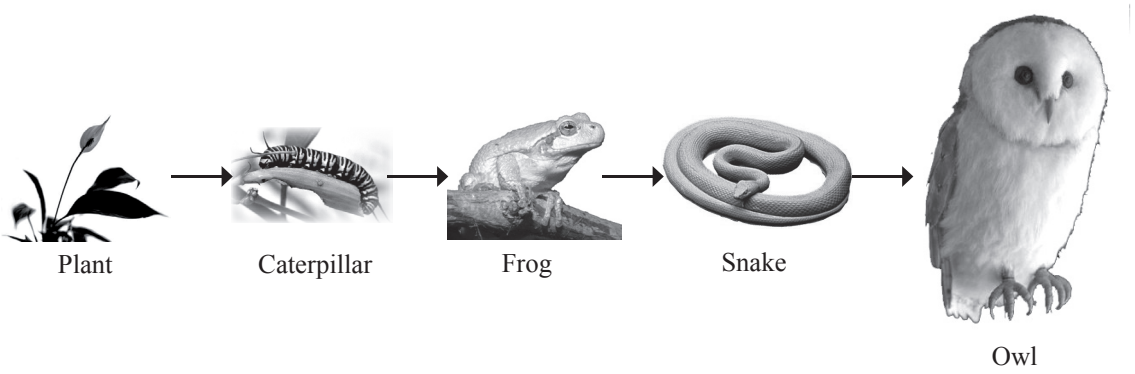
A. Two different species of the same genus

B. The same species of the same genus

C. The same species but of a different genus

D. Two different species of a different genus

22. This diagram represents a simple food chain. In which ways is energy lost between the trophic levels?



I. Heat loss through cell respiration
II. Material not consumed
III. Material not assimilated

A. I and II only

B. I and III only

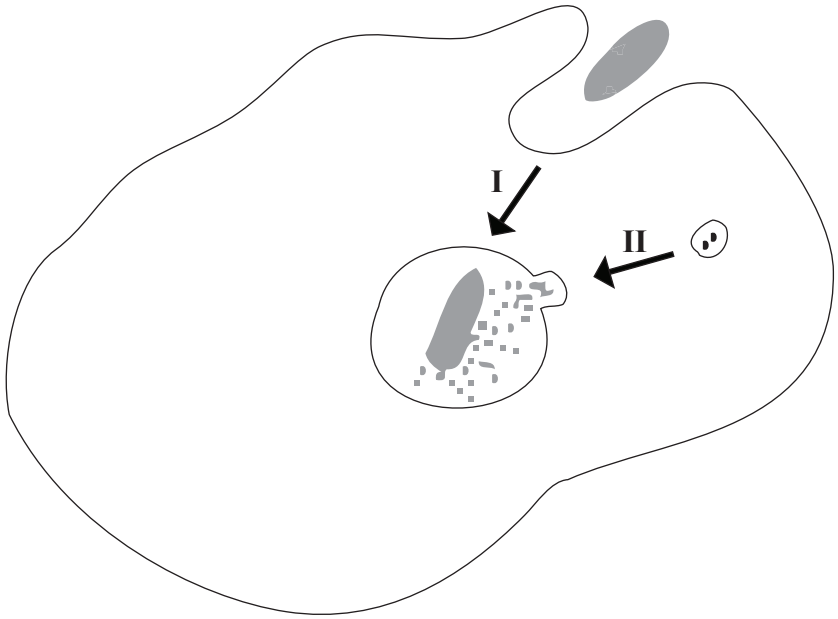
C. II and III only

D. I, II and III

23. In the digestive system, enzyme A has an optimum pH of 1.5 and enzyme B an optimum pH of 7. What are the possible substrates of these enzymes?

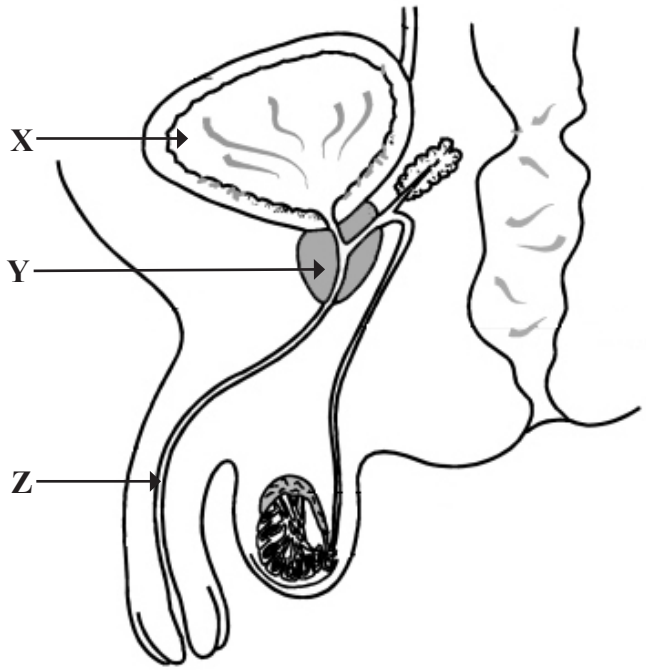
	Enzyme A	Enzyme B
A.	proteins	amino acids
B.	lipids	proteins
C.	carbohydrates	lipids
D.	proteins	lipids

24. Which processes are represented by the labels in the diagram below?



	I	II
A.	A phagocyte ingesting a microbe by exocytosis.	Digestion of the microbe with the help of the Golgi apparatus.
B.	A phagocyte ingesting a microbe by endocytosis.	Digestion of the microbe with the help of a lysosome.
C.	A phagocyte ingesting a microbe by exocytosis.	Digestion of the microbe with the help of a lysosome.
D.	A phagocyte ingesting a microbe by endocytosis.	Digestion of the microbe with the help of the Golgi apparatus.

25. The diagram below shows the human male reproductive system and associated organs.



Which of the labelled structures indicate the bladder, prostate and urethra?

	Bladder	Prostate	Urethra
A.	Y	X	Z
B.	X	Y	Z
C.	Z	X	Y
D.	X	Z	Y

26. What happens during inhalation?

A. Both the external intercostal muscles and the diaphragm contract.

B. The internal intercostal muscles contract and the diaphragm relaxes.

C. The external intercostal muscles relax and the diaphragm contracts.

D. Both the internal intercostal muscles and the diaphragm relax.

27. Which of the following best describes the composition of human blood?

A. erythrocytes, leucocytes and platelets

B. erythrocytes, phagocytes and platelets

C. erythrocytes, lymphocytes and platelets

D. erythrocytes, antigens and platelets

28. Which of the following best describes antibodies?

A. made by phagocytes and specific to one antigen

B. made by lymphocytes and specific to one antigen

C. made by leucocytes and non-specific

D. made by phagocytes and non-specific

29. Which play a role in controlling body temperature?

I. blood
II. skin arterioles
III. body hair

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

30. In a human diet, what effect does a high intake of both protein and salt have on urea and salt concentrations of urine?

	Urea Concentration	Salt Concentration
A.	High	Low
B.	Low	High
C.	High	High
D.	Low	Low