



**BIOLOGY  
STANDARD LEVEL  
PAPER 1**

Wednesday 7 May 2003 (afternoon)

45 minutes

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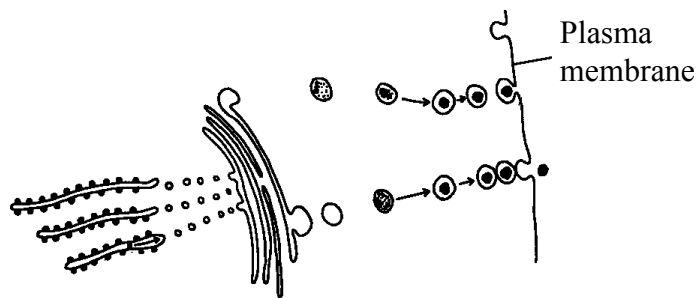
**INSTRUCTIONS TO CANDIDATES**

- 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. Which characteristic applies to **all** prokaryote cells?

- A. They have a nucleus.
- B. They have chlorophyll.
- C. They have mitochondria.
- D. They have ribosomes.

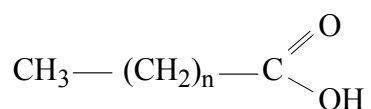
2. In the diagram below macromolecules are being transported to the exterior of a cell.



What is the name of this process?

- A. Exocytosis
  - B. Pinocytosis
  - C. Endocytosis
  - D. Phagocytosis
3. Which structural feature(s) is/are characteristic of viruses?
- I. DNA or RNA
  - II. A protein coat
  - III. Ribosomes
- A. I only
  - B. I and II only
  - C. II and III only
  - D. I, II and III

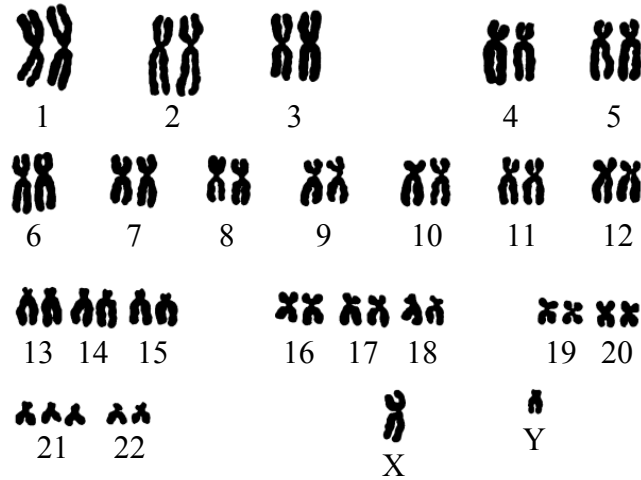
4. What is the function of the lysosome in cells?
- A. Digestion of substances
  - B. Manufacture of food storage molecules
  - C. Release of energy
  - D. Manufacture of proteins
5. What is essential for diffusion?
- A. A concentration gradient
  - B. A selectively permeable membrane
  - C. A source of energy
  - D. A protein
6. Which statement best describes a role of mitosis?
- A. It increases genetic variation.
  - B. It facilitates growth of unicellular organisms.
  - C. It facilitates reproduction of some unicellular organisms.
  - D. It repairs damaged cells.
7. What molecule does the following diagram represent?



- A. An amino acid
- B. A fatty acid
- C. A phospholipid
- D. A monosaccharide

8. What element is found in all proteins?
- A. Iron
  - B. Nitrogen
  - C. Potassium
  - D. Phosphorus
9. Between which bases are hydrogen bonds formed in DNA?
- A. C and U
  - B. T and G
  - C. A and T
  - D. U and A
10. What is the function of helicase?
- A. It forms bonds between DNA nucleotides.
  - B. It adds new nucleotides to the DNA helix.
  - C. It forms the DNA helix.
  - D. It separates DNA strands.

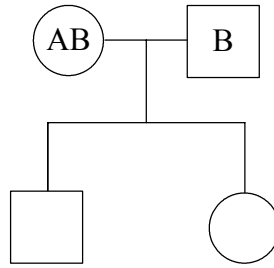
11. The diagram below is a karyotype of a human.



Which statement about the karyotype is correct?

- A. Non-disjunction has occurred and the individual is female.
  - B. Non-disjunction has not occurred and the individual is female.
  - C. Non-disjunction has occurred and the individual is male.
  - D. Non-disjunction has not occurred and the individual is male.
12. What is the **minimum** number of alleles that may be present for a given genotype controlled by a single gene?
- A. One
  - B. Two
  - C. Three
  - D. Four
13. What is the locus of a gene?
- A. The characteristics that a gene determines
  - B. All the alleles of a gene
  - C. The position of a gene on a chromosome
  - D. The site of translation of a gene

14. The pedigree chart below shows the inheritance of blood groups in a family.

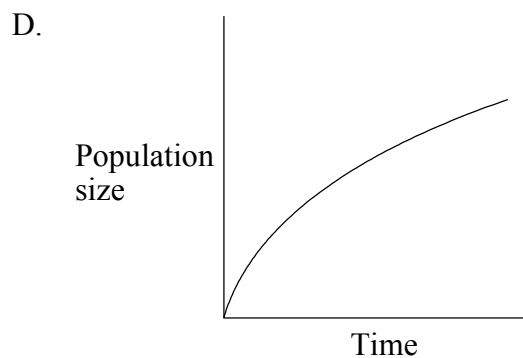
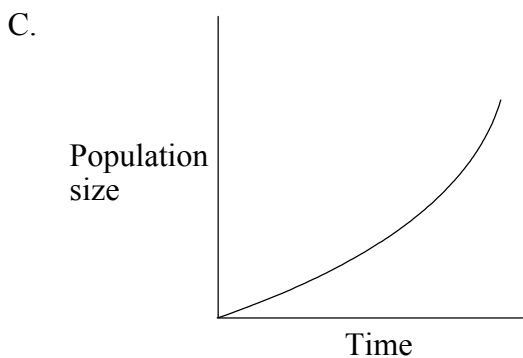
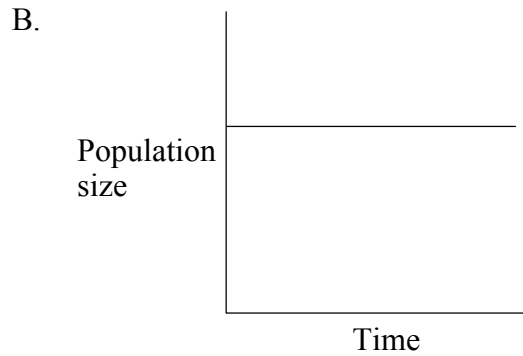
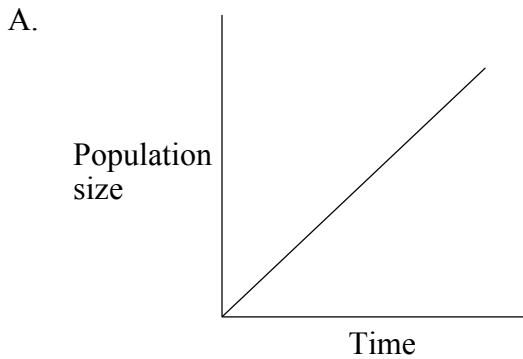


What blood group(s) could the children have?

- A. Type A only
  - B. Type A or B only
  - C. Type A or B or AB only
  - D. Type A or B or AB or O
15. When red shorthorn cattle are crossed with white shorthorn cattle the offspring are roan, a colour that has both red and white hairs. What does this cross illustrate?
- A. Co-dominance
  - B. Multiple alleles
  - C. Sex linkage
  - D. Mutation
16. What is the name of the process used to copy and amplify minute quantities of deoxyribonucleic acid?
- A. DNA profiling
  - B. Gel electrophoresis
  - C. Genetic screening
  - D. Polymerase chain reaction (PCR)

17. Which enzymes are needed to produce recombinant plasmids that are used in gene transfer?
- A. DNA polymerase and ligase
  - B. DNA polymerase and restriction enzymes
  - C. Restriction enzymes and ligase
  - D. Helicase and restriction enzymes
18. What name is given to an organism that ingests dead organic matter?
- A. Autotroph
  - B. Detritivore
  - C. Herbivore
  - D. Parasite
19. Which series of ecological units is in the correct order of decreasing biomass?
- A. Ecosystem, population, community, individual
  - B. Biosphere, ecosystem, population, individual
  - C. Community, biosphere, population, individual
  - D. Biosphere, ecosystem, population, community
20. Which group always occupies the second position of a food chain?
- A. Decomposer
  - B. Primary consumer
  - C. Producer
  - D. Secondary consumer

21. Which graph correctly shows the increase in the size of a population during the exponential growth phase?



22. Which calculation would an ecologist make to examine the spread of values about a mean?

- A. Correlation
- B. Carrying capacity
- C. Lincoln index
- D. Standard deviation

23. What is the primary cause of the “struggle for survival” between individuals of a species?

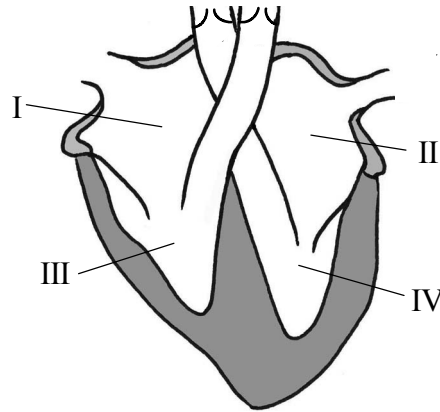
- A. The innate tendency of organisms in populations to compete against each other
- B. The need for organisms to fight against natural disasters and diseases
- C. The genetic variability among organisms of different species
- D. The tendency for populations to produce more offspring than can be supported



24. What information is included in a binomial name?
- A. Class and species
  - B. Species and genus
  - C. Order and class
  - D. Genus and family
25. What statement can be made about members of the same order?
- A. They all belong to the same genus.
  - B. They all belong to the same class.
  - C. They all belong to the same family.
  - D. They can all interbreed successfully.
26. Which response is correct regarding the function of the blood vessels listed below?

<b>Blood Vessels</b>			
	<b>Arteries</b>	<b>Capillaries</b>	<b>Veins</b>
A.	Transport of oxygenated blood	Exchange of gases	Transport of deoxygenated blood
B.	Transport of deoxygenated blood	Exchange of gases	Transport of oxygenated blood
C.	Transport of blood to the heart	Transport of blood from veins to arteries	Transport of blood away from the heart
D.	Transport of blood away from the heart	Transport of blood from arteries to veins	Transport of blood to the heart

27. Which chamber pumps blood to the lungs?



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

28. Which process results in inhalation?

- A. An increase in volume of the chest cavity
- B. An increase in pressure in the chest cavity
- C. Relaxation of the external intercostal muscles
- D. Relaxation of the diaphragm

29. Which list shows a correct sequence of events during human reproduction?

- A. blastocyst formation, fertilization, implantation
- B. fertilization, copulation, implantation
- C. copulation, fertilization, ovulation
- D. ovulation, fertilization, implantation

- 30.** A synthetic hormone, syntocin, has the same effect on the body as oxytocin. For what purpose would syntocin be used?
- A. Control of blood glucose levels
  - B. Inhibition of the menstrual cycle
  - C. Regulation of the heart rate
  - D. Stimulation of uterine contraction
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