

INTERNATIONAL BACCALAUREATE

BIOLOGY

Subsidiary Level

Paper 1

Tuesday, 12 May 1987 (morning)

1½ hours

INSTRUCTIONS

This Paper consists of two Sections, Section I in this booklet, and Section II in a separate booklet. Both Sections carry equal weight. You are advised to spend about 45 minutes on each Section.

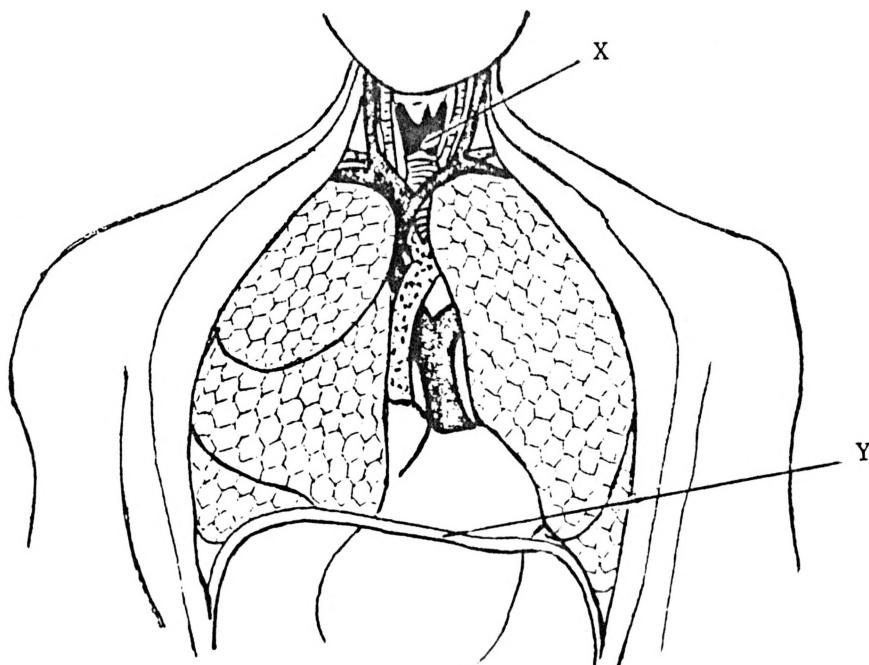
SECTION I

There are 30 questions in this Section and you should attempt them all.

For each question there are 4 suggested answers. Read each question carefully. When you have selected the answer you consider to be the best, indicate your choice on the answer sheet provided. Choose only one answer for each question.

Your score for this Section will depend on the total number of correct answers you give.

ALL ANSWERS MUST BE GIVEN ON THE SPECIAL ANSWER SHEET



Study the above diagram and answer questions 1 and 2.

1. The organ labelled X is

- A. the thyroid.
- B. the larynx.
- C. the oesophagus.
- D. the pituitary.

2. The organ labelled Y is

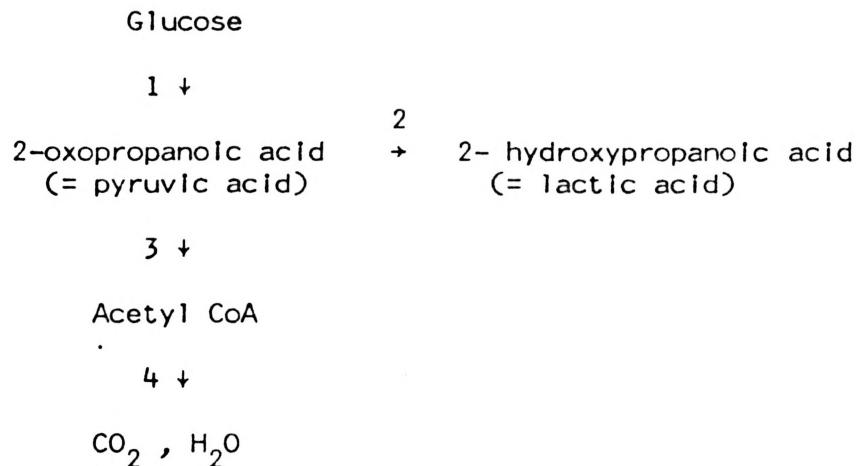
- A. the stomach.
- B. the diaphragm.
- C. the liver.
- D. the pulmonary wall.

3. The heart sends out
- A. deoxygenated blood via the aorta and oxygenated blood via the pulmonary arteries.
 - B. deoxygenated blood via the pulmonary arteries and oxygenated blood via the aorta.
 - C. oxygenated blood via the pulmonary veins and deoxygenated blood via the venae cavae.
 - D. oxygenated blood via the pulmonary veins and via the aorta.
4. In a normal human, the average number of red cells per mm³ of blood is
- A. one.
 - B. 700.
 - C. 5 000.
 - D. 5 000 000.
5. In the pulmonary alveoli, the air is in contact with
- A. pulmonary alveolar cells.
 - B. the wall of the blood capillaries.
 - C. the blood.
 - D. the red cells.
6. The lowest energy expenditure in kJ/m²/24 h is that of
- A. a 10-year-old boy.
 - B. a 10-year-old girl.
 - C. a 60-year-old man.
 - D. a 60-year-old woman.

7. To build their proteins, humans
 - A. are capable of synthesizing all the necessary amino acids.
 - B. are incapable of synthesizing any of the necessary amino acids.
 - C. use unchanged the proteins in their foodstuffs.
 - D. are capable of synthesizing some amino acids but have to use other amino acids provided by the food.
8. In the male of the human species, a secondary sexual characteristic is controlled by
 - A. a gene on the X chromosome.
 - B. the male germ cells.
 - C. the male hormones.
 - D. a gene on the Y chromosome.
9. A thyroid hormone acts on the hypothalamus. The latter acts on the anterior pituitary which secretes less thyrotropin (thyroid-stimulating hormone). This is an example of
 - A. a reflex arc.
 - B. feedback control.
 - C. thyroid deficiency.
 - D. a physiologically impossible process.
10. The main hormone involved in labour (childbirth) is
 - A. FSH.
 - B. prolactin.
 - C. LH.
 - D. oxytocin.

11. It is found that 1 mm of an objective micrometer corresponds to 6 graduations of an eyepiece micrometer. The actual size of a cell measuring 0.2 graduation of the eyepiece micrometer is
- A. 3.3 mm.
 - B. 333 μ m.
 - C. 33 μ m.
 - D. 3 μ m.
12. The process whereby large particles are incorporated into a cell is known as
- A. pinocytosis.
 - B. diffusion.
 - C. osmosis.
 - D. phagocytosis.
13. The four most abundant chemical elements in living matter are
- A. carbon, oxygen, nitrogen, sodium.
 - B. carbon, hydrogen, nitrogen, sodium.
 - C. oxygen, carbon, hydrogen, nitrogen.
 - D. carbon, phosphorous, sulphur, potassium.
14. The lack of a red precipitate when urine is heated with Fehling's (or Benedict's) reagent indicates the absence of
- A. lipids.
 - B. proteins.
 - C. reducing sugars.
 - D. urea.

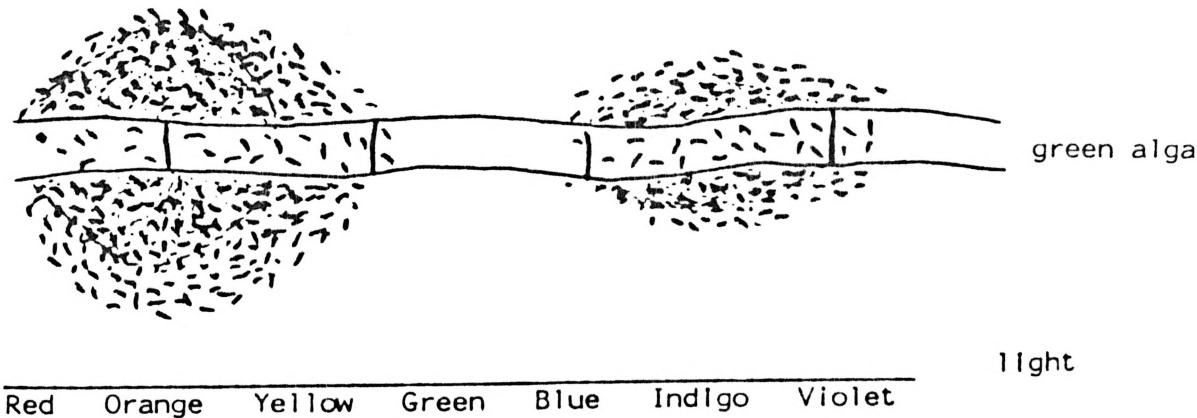
15. The diagram below summarises the stages in the metabolism of glucose in a mammalian skeletal muscle.



Which of the following alternatives corresponds to the stage(s) involved in glycolysis?

- A. 1
 - B. 1 and 2
 - C. 1 and 3
 - D. 1, 3 and 4

16. A microscope preparation is made by arranging a filamentous green alga in a drop of a culture of a soil bacterium, Bacterium termo. The natural light used in the microscope is split by a prism before illuminating the preparation. After a certain time, the following distribution of the bacteria is observed:



20. The centromere of a chromosome in mitosis divides immediately after
- A. Interphase.
 - B. prophase.
 - C. metaphase.
 - D. anaphase.
21. How many chromatids are there in a human cell nucleus in prophase I of meiosis?
- A. 92
 - B. 69
 - C. 46
 - D. 23
22. In the human species, the sex of a child depends on
- A. the existence of two sorts of spermatozoa.
 - B. the precise moment of fertilization with respect to ovulation.
 - C. the existence of two sorts of ova.
 - D. the placental hormones.
23. Albinism is a pigmentation defect controlled by a recessive gene. What is the probability that two albino parents may have a normally pigmented child?
- A. 0
 - B. 1/4
 - C. 1/2
 - D. 1

24. Two individuals AA bb and aa BB are crossed, the genes A and B not being linked. In what proportion will the hybrid obtained produce gametes AB?
- A. 1/2
B. 0
C. 9/16
D. 1/4
25. A mother has a child of blood group O. The father cannot be of group
- A. A.
B. B.
C. O.
D. AB.
26. An aquarium in equilibrium can be considered to be
- A. an ecosystem.
B. a community.
C. a population.
D. an ecological niche.
27. In a certain habitat at a given moment, a biological community is best defined as an interacting assembly of
- A. individuals.
B. ecosystems.
C. producers.
D. populations.