# INTERNATIONAL BACCALAUREATE

**BIOLOGY**

**Subsidiary Level**

**Wednesday 8 May 1991 (afternoon)**

**Paper 1** **45 minutes**

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*INSTRUCTIONS*

*There are 30 questions in this paper 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 paper will depend on the total number of correct answers given.*

*ALL ANSWERS MUST BE GIVEN ON THE SPECIAL ANSWER SHEET*

1. Hydrochloric acid secreted in the stomach is an important factor in the transformation of

   A. pepsin into pepsinogen.

   B. pepsinogen into pepsin.

   C. proteins into aminoacids.

   D. maltose into glucose.

2. The end product of starch digestion is

   A. maltose.

   B. maltase.

   C. glycerol.

   D. glucose.

3. Plasma and lymph fluids are different in that

   A. plasma contains proteins and leucocytes, lymph contains erythrocytes and proteins.

   B. plasma contains proteins, water, minerals and nutrients, lymph contains water and hormones.

   C. lymph is the intercellular fluid, plasma is the liquid part of the blood.

   D. lymph contains only lymphocytes, plasma contains erythrocytes and leucocytes.

4. Which one of the following blood transfusions is possible without risk of agglutination?

| | Donor blood group | Recipient blood group |
|---|---|---|
| A. | AB | A |
| B. | A | O |
| C. | B | A |
| D. | A | AB |

5. Air enters the lungs of a Mammal because

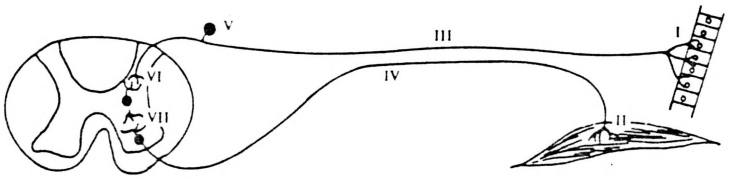
   A. it is pushed along the trachea by swallowing.

   B. in inspiration the lungs expand forcing the thorax to expand.

   C. in inspiration the pleural pressure falls and lowers the lung pressure.

   D. in inspiration the atmospheric pressure becomes lower than the pleural pressure.

*Questions 6 and 7 refer to the following diagram of a reflex arc in a Vertebrate*




6. Numbers VI, VII and II represent

   A. neurones.

   B. axons.

   C. synapses.

   D. dendrites.

7. Axons from motor neurons are represented by

   A. I and II.

   B. IV.

   C. V.

   D. III.

8. Progesterone secreted by the corpus luteum inhibits the development of new follicles in the ovary by means of a feedback mechanism which

   A. inhibits FSH production.

   B. inhibits the corpus luteum.

   C. inhibits the production of prolactin.

   D. results in an increase of oestrogen production.

9. Implantation of the blastocyst normally takes place in the

   A. epithelium of the uterus.

   B. fallopian tube.

   C. uterine wall (endometrium).

   D. ovary.

10. Oxytocin is a hormone secreted by the

A. posterior lobe of the pituitary that stimulates the contraction of the uterine muscle.

B. ovary that stimulates the production of progesterone.

C. corpus luteum that stimulates the contraction of the uterus.

D. placenta that stimulates the contraction of the uterine muscle.

11. A skin cell of a given species has 28 chromosomes in its nucleus. The number of chromosomes in the nucleus of a secondary spermatocyte of that species is

A. 28.

B. 14.

C. 13.

D. 27 + Y.

12. Structures present in plant cells but not in animal cells are

A. lysosomes and ribosomes.

B. large vacuoles and plastids.

C. cellulose walls and mitochondria.

D. nucleolus and chloroplasts.

13. In a cell the most readily available energy source is

A. glucose.

B. NAD.

C. ATP.

D. 2-oxo-propanoic acid (pyruvic acid).

14. The oxygenation of blood in the lung alveolus is an example of

A. active transport.

B. osmosis.

C. diffusion.

D. ultra-filtration.

15. Enzymes

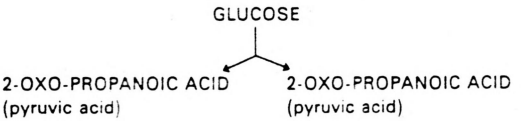
A. are sensitive to pH.

B. are destroyed by the reaction they catalyse.

C. increase the reaction time.

D. increase activation energy.

*Questions 16 and 17 refer to the following diagram which represents a cellular process in which only the initial and final compounds are shown.*




16. For the process to take place it is necessary to have

A. mitochondria.

B. enzymes and ATP.

C. active RNA and enzymes.

D. hormones and NAD.

17. The process is known as

A. Krebs cycle.

B. Calvin cycle.

C. respiration.

D. glycolysis.

18. Yeast can survive in the absence of free oxygen because it respires

A. $NO_2$.

B. anaerobically.

C. $CO_2$.

D. without enzymes.

19. Which compound is present in DNA but not in RNA?

A. Adenine

B. Guanine

C. Cytosine

D. Thymine

20. A codon on m-RNA is represented by UGC, the corresponding t-RNA anticodon can be

A. UGC.

B. TCG.

C. ACG.

D. CGU.

*Use the following information to answer questions 21 and 22.*
*In some species of Amphipods (Crustacean), the gene for black eyes, B, is dominant to that responsible for red eyes, b.*

21. If a male homozygous for black eyes is crossed with a red eyed female, the genotype of the offspring for eye colour will be

A. BB.

B. bb.

C. Bb.

D. BBbb.

22. What will be the percentage of red eyed offspring following a cross between a heterozygous black eyed male and a red eyed female?

A. 0 %

B. 50 %

C. 75 %

D. 100 %

23. Colour blindness is a sex linked recessive characteristic. Children of a colour blind mother and a normal father would be

A. females normal but carriers, males normal.

B. females colour blind, males normal.

C. females normal, males colour blind.

D. females normal but carriers, males colour blind.

24. In Mammals adaptive radiation is shown by the forelimbs of the bat, the whale and the monkey. These forelimbs are examples of

A. homology.

B. analogy.

C. coincidence.

D. use and disuse.

25. Lamarck's theory of evolution assumed that

A. considerable variation exists among members of a given species.

B. there always tends to be a struggle for existence.

C. evolutionary change could be achieved by the transmission of characters acquired through the influence of the environment.

D. organisms generally produce far more offspring than the environment can support.

26. The term 'habitat' describes

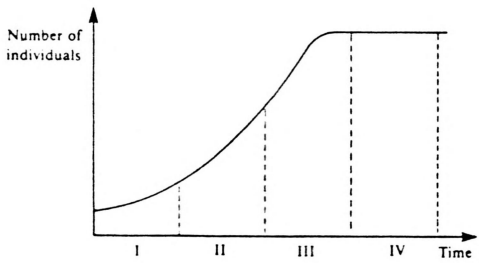
A. the space an organism occupies in a given environment.

B. a given area of an ecosystem with its fauna and flora.

C. the feeding habits of a given species in an ecosystem.

D. a geographically isolated area with its fauna and flora.

27. The following is a graph of a population curve.




The period in which there is a balance between birth rate and death rate in the population is

A. I.

B. II.

C. III.

D. IV.

28. Clover (a leguminous plant) grows in soils poor in nitrogen. This statement is only possible because

A. clover does not need nitrogen.

B. its cells are capable of direct fixation of atmospheric nitrogen.

C. its cells are associated with denitrifying bacteria.

D. its cells are associated with nitrifying bacteria.

29. Different communities of organisms which interact with one another and the abiotic factors of the environment are described as

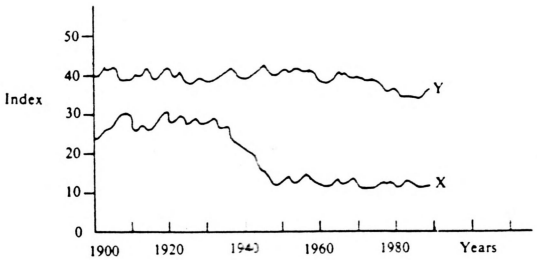
A. populations.

B. societies.

C. ecosystems.

D. a climax community.

30. The following graph shows the variation in mortality index (Curve X) and natality index (Curve Y) in a given human population. Variation due to migration is compensated for.




In what period has this population shown the highest growth?

A. 1920 to 1930

B. 1940 to 1950

C. 1950 to 1960

D. 1970 to 1980