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*2007 Past GCE
Advanced Level
Biology Paper 2*

June 2007

1. (a) State why lower organisms such as protozoans and cnidarians lack a defined respiratory organs
- (b) (i) Compare the properties of air and water as respiratory media
- (ii) Name any three respiratory pigments with their corresponding metals and state a group of animals in which each pigment is found. (Present your answer in a tabular form).
- (c) Describe how ventilation is controlled in mammals e.g. man. (2, 8, 10 mks)

2. Use suitable examples to illustrate the meaning of the following terms,

(i) Energy flow through an ecosystem

(ii) Acid rain

(iii) Global warming and

(iv) Endangered species

3. (a) Explain the meaning of the following, using specific examples:

(i) Enzyme repression (ii) Enzyme induction

(b) Explain why protein synthesis through enzyme repression and enzyme induction is described as a feedback process (or cellular homeostasis).

(c) Describe the feedback control of protein synthesis by a regulator gene.

4. (a) State Mendel's second law

(b) Explain what is meant by recombinant

(c) A homozygous purple flower, short stemmed plant was crossed with a homozygous red flower, long stemmed plant and the F₁ phenotypes had purple flowers and short stems. When the F₁ generation was test crossed with a double homozygous recessive plant, the following progeny were produced.

52 purple flower short stem

47 purple flower long stem

49 red flower short stem

45 red flower, long stem

Explain these results fully.

5(a) Compare and contrast the features of annelids and arthropods.

(b) (i) Distinguish between a holometabolous and a hemimetabolous life cycle.

(ii) Give two advantages of a life cycle that incorporates metamorphosis.

(c) Using a precise example of an insect, briefly describe complete metamorphosis. (6, 2, 4, 8 mks)

6. (a) Briefly explain the mechanism of the following processes giving examples of where they occur,

(i) Diffusion (ii) Active transport (iii) Pinocytosis (iv) Phagocytosis

(b) (i) List the features that affect the rate of diffusion

(ii) Suggest why active transport is affected by oxygen concentration and diffusion is not.

7. (a) What are the differences between endocrine and nervous systems?

(b) Draw a well labelled diagram of the longitudinal section of the human brain and state its functions and its main parts.

8. (a) State how nervous impulses may be impaired.

(b) State the differences between the following; (i) Chromosome and gene mutation.

(ii) Somatic and germ mutations

(c) Describe five mechanisms by which chromosome mutation may occur.

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