SULIT 964/2
BIOLOGY
2006
2 1/2 hours

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA SEKOLAH MENENGAH MALAYSIA CAWANGAN MELAKA PEPERIKSAAN PENGESANAN SIJIL TINGGI PELAJARAN MALAYSIA TAHUN 2006

BIOLOGY
PAPER 2

Instruction to candidates:
Answer **all** the questions in section A in the spaces provided.
Answer any **four** questions from section B. For this section, write your answers on the answer sheets. Begin each answer on a fresh sheet of paper. Answers should be illustrated by large, clearly labeled diagrams wherever possible.
Arrange your answers in numerical order and tie the answer sheets together.

For examiner's use
1
2
3
4
5
6
7
8
9
10
TOTAL

This paper consists of **8** printed pages.

Section A [40 marks]

Answer **all** the questions in the spaces provided.

1 (a) List **three** ways in which transcription differs from translation in protein synthesis.

1 .....

.....

2 .....

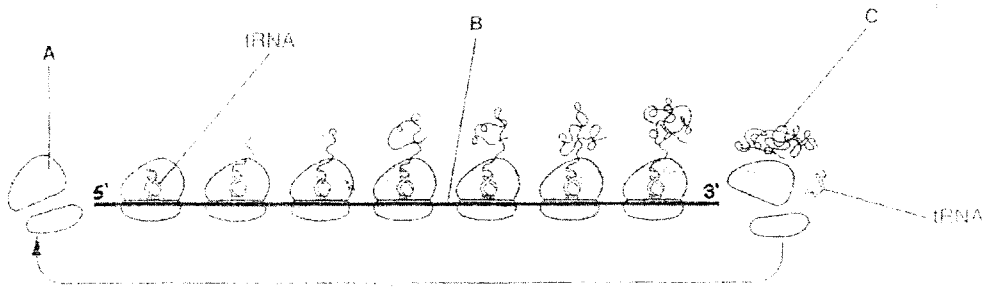
.....

3 .....

.....

[3]

The diagram below represents a polysome with several translation sites.



(b) Name the structures labeled A to C. [3]

A .....

B .....

C .....

(c) Name **two** molecules, in addition to the molecules shown above which are required to complete translation. [2]

1 .....

2 .....

(d) Describe **two** structural features which adapt tRNA to its function in translation. [2]

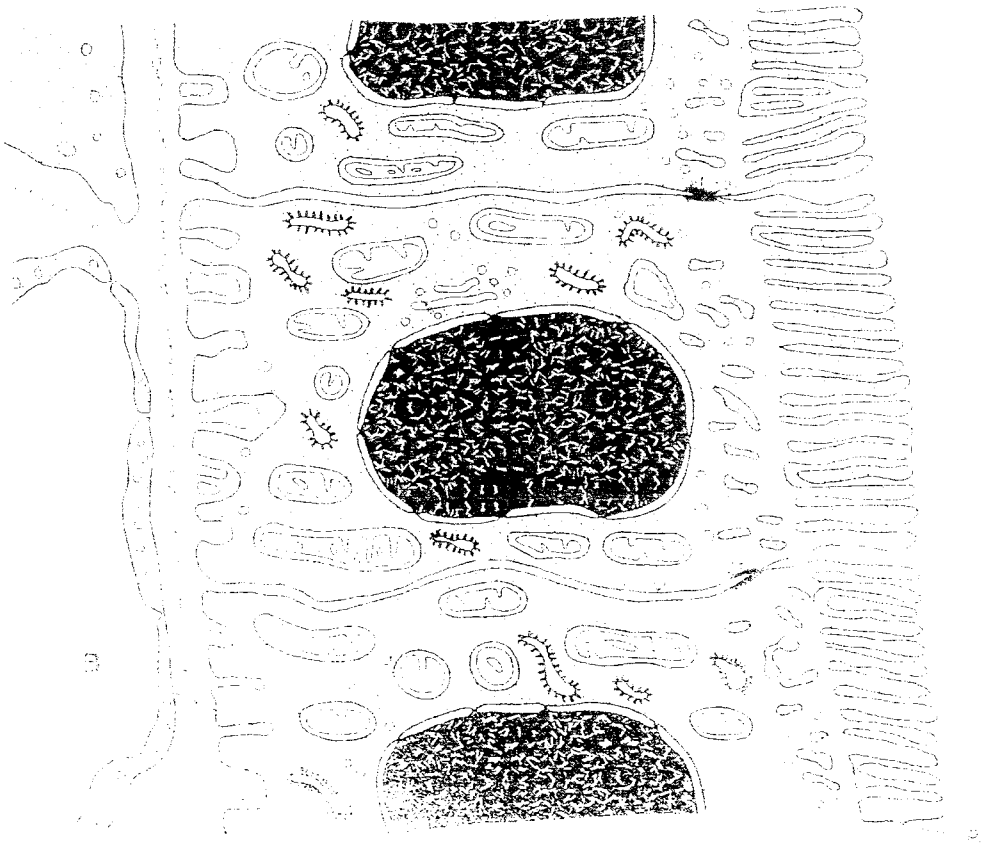
.....

.....

.....

.....

2. Below is a diagram of a section through the proximal convoluted tubule of a kidney nephron showing details of cell structure, as seen with the electron microscope.



a) Name the structures A and B.

A:..... B:..... [2]

b)Explain three ways in which the cells of the proximal convoluted tubules are adapted for selective reabsorption.

1.....

.....

2.....

.....

3.....

.....

[3]

c) Describe the mechanism of glucose reabsorption into the blood from the lumen of the proximal convoluted tubule of the kidney.

.....

.....

.....

.....

.....

[3]

d) Outline, in terms of water potential, how water is reabsorbed by the cells of the proximal convoluted tubule.

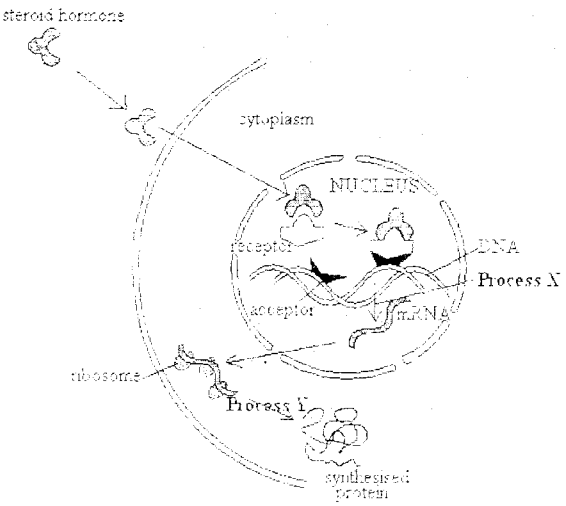
.....

.....

.....

[2]

3. The diagram below shows the action of a steroid hormone on a target cell.



(a) Give one example of a steroid hormone and its target cell. [2]

Example of hormone: .....

Target cell: .....

(b) By referring to the above diagram, explain the mechanism of action of a steroid hormone. [3]

.....

.....

.....

.....

(c) By referring to the above diagram, name the following processes:

Process X:.....

Process Y:..... [2]

(d) While steroid hormones play an important role in development, steroid drugs are often open to abuse. State **one** ill-effect of steroid abuse. [1]

.....

.....

(e) In terms of permeability through the plasma membrane, how do steroid hormones differ from peptide hormones? [2]

.....

.....

4. (a) Bilateral symmetry, triploblastic organization, segmentation, presence of a coelom and nephridia are characteristics of some animals.

(i) State the phylum to which these animals belong..... .[1]

(ii) Give the name of the class of animals in this phylum that characteristically possess a clitellum.

....[1]

(iii) State 1 other way in which this class differs from others in this phylum.

....

..... [1]

(b) (i) Give the name of another phylum that possesses 4 of the characteristics listed in (a).

.... [1]

(ii) Which characteristic listed is not shown by this second phylum?

..... [1]

(iii) List 2 other ways of distinguishing between members of the 2 phyla in addition to any in the list of 5 in part (a).

.....

....[2]

(c) Draw and label a diagram to show the basic chordate body plan. [3]

Section B [60 marks]

Answer any **four** questions from this section

5 (a) With the aid of a labeled diagram, explain the mechanism of enzyme action using the "Lock and Key" hypothesis. [7]

(b) (i) Explain briefly what are enzyme inhibitors. [2]

(ii) Differentiate between competitive inhibitors and non-competitive inhibitors. [6]

6 (a) Outline the steps involved in the synthesis of carbohydrate in plants from a molecule of carbon dioxide in the atmosphere. [9]

(b) Distinguish between oxidative phosphorylation and photophosphorylation. [6]

7 (a) Draw a clearly defined, labeled diagram to show the structure of

(i) a myofibril [2]

(ii) a neuromuscular junction [3]

(b) Describe the sequence of events which occur in the stimulation and contraction of a skeletal muscle fibre. [10]

8 (a) With the aid of a fully labeled diagram, explain briefly the structure of an antibody molecule. [3]

(b) (i) Explain the meaning of *immune response*. [2]

(ii) Explain the role played by the lymphocytes in producing immunity in humans. [10]

9 (a) Differentiate between the following pairs of genetic terms:

(i) genotype and phenotype

(ii) monohybrid inheritance and dihybrid inheritance

(iii) linkage and crossing over

(iv) sex determination and sex linkage [8]

(b) With the aid of diagrams, show how colour-blindness occurs in males but not in females. [7]

10 (a) By referring to a named ecosystem radiated by solar energy, explain the flow of energy through it and emphasise on the efficiency of energy transfer. [8]

(b) Biogeochemical cycle plays an important role in environmental equilibrium. Explain briefly the phosphorus cycle occurring on earth. [7]