

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2002

Educational Assessment Unit - Education Division

FORM 5

BIOLOGY

TIME 1h 45min

Name : _____ Class _____

SECTION A : This section carries 55 marks

ANSWER ALL QUESTIONS IN THE SPACES PROVIDED.

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1. Study the following table showing the composition of 100g of each nut:

	Fat/Lipid	carbohydrates	Protein	Water
Peanut	55g.	12g.	28g.	5g.
Walnut	55g.	8g.	12g.	25g.
Brazil Nut	65g.	11g.	16g.	8g.
Chestnut	6g.	37g.	2g.	55g.

If the energy available: from FATS/LIPIDS is 35KJ/g;

from CARBOHYDRATES is 17KJ/g and

from PROTEINS is 17KJ/g.

- a. Calculate the energy content in KJ per 100g. of :

(i) **100g. of Peanut** (show your workings):

ANSWER: _____ (3,1)

- b. Give 2 reasons why chestnuts have less energy than the others.

(i) _____
(ii) _____ (1,1)

- c. List 2 reasons (other than Energy value) why Fats/Lipids are important in the diet:

(i) _____
(ii) _____ (1,1)

(total 8 marks)

2. To test a leaf for starch, it was first dropped in boiling water, then boiled in reagent X, washed, and finally treated with reagent Y.

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- a. Name the two reagents used:

Reagent X: _____; Reagent Y: _____. (1,1)

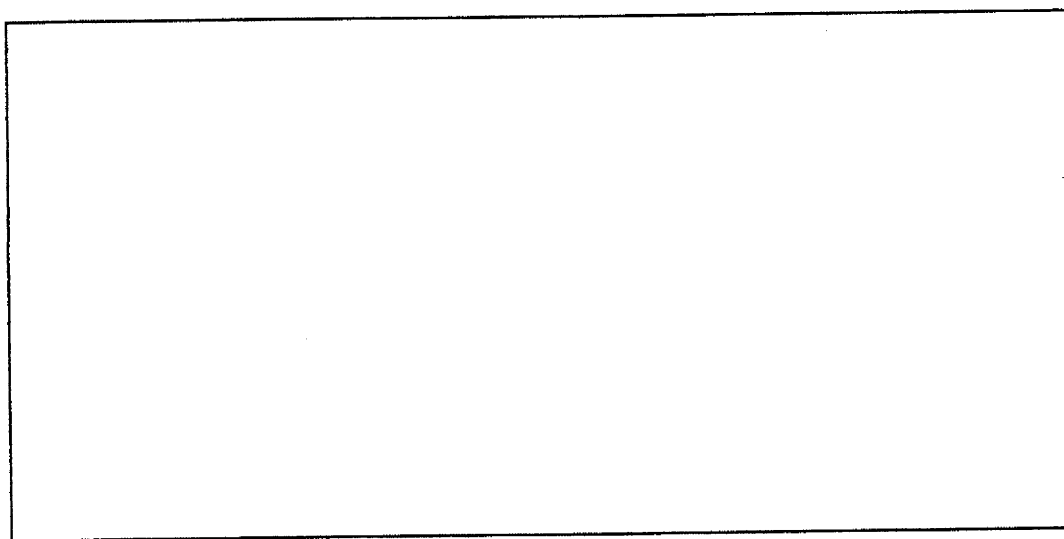
- b. Name the coloured substance removed by Reagent X: _____. (1)

- c. Name the process by which starch is produced in the leaf. _____. (1)

- d. Write an equation (in words or symbols) summarising the process named in 2c.

_____ (3)

- e. In the space provided draw a large labelled diagram to show **the internal cellular structure of the leaf**. (6)



(total 13 marks)

3. Read the characteristics of the following organisms and indicate the group described:

- a. Lays eggs with a shell on land. Have wings and feathers but no teeth. _____ (1)

- b. Body divided into three parts. Have antennae, six legs, and wings. _____ (1)

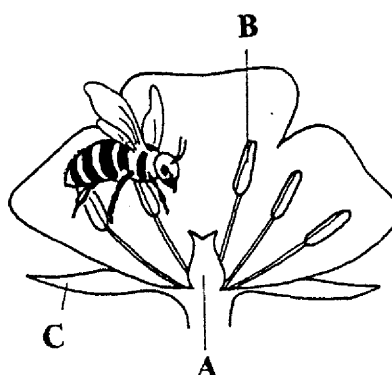
- c. Have chlorophyll, primitive roots, stems and leaves/fronds. Reproduce by means of spores _____ (1)

- d. Have no chlorophyll. Feed by saprophytic or parasitic means. Reproduce by spores.

_____ (1)

(total 4 marks)

4. The following diagram shows an insect-pollinated flower.



a. Name the structures A, B and C.

A: _____; B: _____; C: _____ (3)

b. List two features, shown in the diagram, which help to ensure insect-pollination.

(i) _____ (1)

(ii) _____ (1)

c. A series of events occur when insect-pollination is followed by sexual reproduction in flowers. Arrange these events in the correct order.

A	Meiosis takes place in the anther.
B	Pollen tube grows down into the ovary.
C	A male nucleus fuses with the ovule nucleus.
D	Anthers split open releasing pollen.
E	Insects transfer pollen from anther to stigma.

(5)

FIRST	SECOND	THIRD	FORTH	FIFTH

(total 10 marks)

5. The liver is a vital organ in the humans.

Give **three importances** of the liver in the human body.

(i) _____

(ii) _____

(iii) _____

(total 3 marks)

6. Name the major blood vessels that carry blood:

- (i) from heart to lungs: _____ (1)
 (ii) away from the kidneys to the heart: _____ (1)
 (iii) from the alimentary canal (intestines) to the liver _____ (1)
 (iv) from the rest of the body to the heart _____ (1)
 (v) from the heart towards the rest of the body _____ (1)

(total 5 marks)

7. Match the terms in list X with descriptions in list Y.

List X	List Y
1. Urine	a. harmful waste product made in liver.
2. Urea	b. tube that carries urine from kidney to bladder.
3. Urethra	c. solution excreted by the kidneys.
4. Ureter	d. tube carrying urine from bladder to the external environment.

ANSWERS:

1	2	3	4

(total 4 marks)

8. Complete the following table showing some of the main hormone-producing glands:

Gland	Hormone produced	Action
Thyroid		Controls metabolic rate.
	Adrenaline	Prepares the body for action
	Insulin	
Ovary	(i)	(i) Controls puberty and menstrual cycle in the female
	(ii) Progesterone	(ii)
		Controls puberty in the male.

(total 8 marks)

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SECTION B : This section carries 45 marks.
(Answer on the separate paper provided).

Answer Question ONE and any other TWO questions.

1. Read the following paragraph and answer the questions below:

The ability to reproduce is vital to the survival of every species let alone the human species. The human reproductive system is probably the most advanced in the animal kingdom. The two separate systems, namely, the male and female reproductive system **produce sex cells** that can fuse to produce a new product or a **fertilised cell**. (line 4)

The human reproductive system differs from that of many animals in certain basic principles. In mammals, **sexual** reproduction results in fertilisation occurring **within the body** of the female. At the end of the gestation period, birth occurs. However, all human communities practise some form of **birth control** to space out births and limit the size of the family.

- a. (i) Name the sex cells produced in the human male and in the human female reproductive system. (1, 1)
- (ii) Name the fertilised cell mentioned in line 4. (1)
- b. Draw a large labelled diagram of the female reproductive system. (5)
- c. State **two** differences between sexual and asexual reproduction. (2)
- d. (i) Where does internal fertilisation usually occur in human females? (1)
- (ii) Describe briefly what happens to the human fertilised cell from fertilisation till implantation. (2)
- e. Name **one** method of 'birth control'. State if this method is classified as a natural or an artificial method of 'birth control'. (2)

(total 15 marks)

2. a. State **three** differences between mitosis and meiosis. (3)
- b. Explain the difference between:
- (i) Homozygous and Heterozygous (2)
- (ii) Genotype and Phenotype. (2)
- c. Brown eye colour is dominant to blue. A man with brown eyes married a woman with blue eyes. Using the appropriate symbols, describe fully, with the help of genetic diagrams, what eye colour are their children likely to have:
- (i) if the man was homozygous for brown eyes. (3)
- (ii) if the man was heterozygous for brown eyes. (3)
- d. Describe briefly what would have happened if both the man and woman had blue eyes. (2)
- (total 15 marks)
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3. a. State **three** differences between physical/nervous and chemical/hormonal co-ordination. (3)
- b. The brain and the spinal cord make up the Central Nervous System.
- (i) How is the brain protected? (2)
- (ii) Describe **one** function of each of the following: (3)
- Cerebrum, Cerebellum and Medulla Oblongata.
- c. State **two** ways in which the responses of mammals differ from those of flowering plants. (2)
- d. Describe, with the help of a well labelled diagram, the events that occur when the hand is removed quickly from a sharp object. (5)
- (total 15 marks)
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4. a. '**Earthworms have a beneficial effect on soil**'. Describe this statement. (3)
- b. 300 g. of fresh fertile soil contains 45g of water. Work out the percentage water content of this soil. Show your working. (3)
- c. State two differences between clay and sandy soil. (2)
- d. Name **two** importances of water to organisms. (2)
- e. Describe an experiment to find out the percentage of **water** content of a particular soil sample. (5)
- (total 15 marks)
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5. a. Define;
- (i) Osmosis (ii) Diffusion (iii) Active Transport (2, 2, 2)
- b. Describe, using diagrams, osmoregulation in a named animal-like protist. (4)
- c. Describe an experiment to demonstrate the principles of osmosis. (5)
- (total 15 marks)