

Junior Lyceum Annual Examinations – 2004
Educational Assessment Unit – Education Division

Form 5

Biology

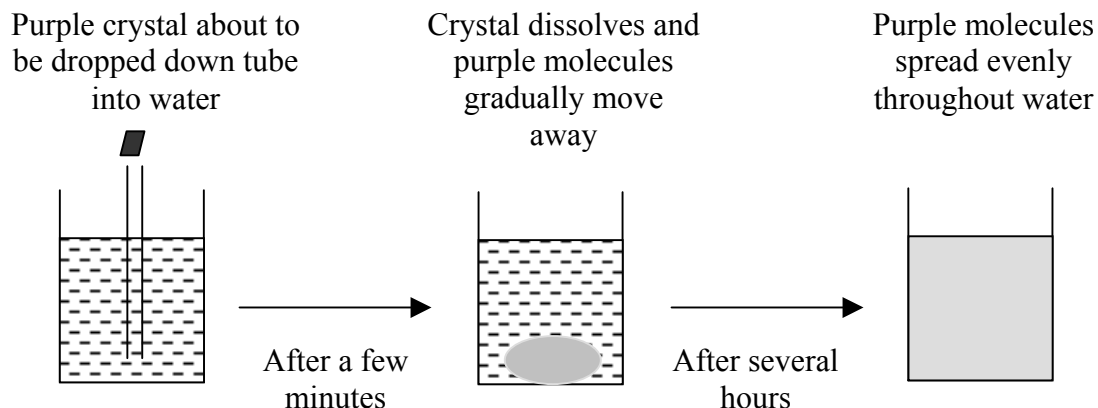
Time: 1h 45m.

Name: _____

Class: _____

SECTION A: This section carries 55 marks.
Answer ALL questions in the space provided.

1. In order to study a particular biological process, Sarah carried out the following experiment.



- (a) What process was Sarah trying to investigate?
_____ (1 mark)
- (b) What conclusion could Sarah draw from the result of this experiment?

_____ (2 marks)
- (c) Give ONE example where such a process occur in life.

_____ (2 marks)

2. Fill in the following passage about insects, using words from the list below.

Note that NOT ALL the words are to be chosen.

egg adult metamorphosis mosquito earthworm locust
nymphs pupa larva proboscis moulting

Insects have two different types of life cycles, namely complete and incomplete _____ . In one case, the egg develops into a miniature adult called _____ , that sheds its cuticle 4 or 5 times in order to grow bigger. The shedding of the cuticle is called _____. One insect which has this kind of life cycle is the _____. In other insects the egg develops into a _____ that looks completely different from the adult. In time, the larva changes into a dormant _____ , from which the _____ eventually emerges. The butterfly and _____ have this kind of life cycle.

(8 marks)

3. (a) Define:

(i) haploid _____

(ii) diploid _____

(4 marks)

(b) List TWO 'organs' in mammals.

(2 marks)

(c) What happens to the chromosome number during the process of meiosis?

(1 mark)

(d) (i) Which process reverses the effect of meiosis in both flowering plants and mammals?
(1 mark)

(ii) What results from the process named in (d) (i)?

(2 marks)

4.(a) What is meant by the following terms:

(i) excretion _____

(ii) secretion _____

(2,2 marks)

(b) Encircle the ONE substance from the list below which is not an excretory product.
bile pigment faeces urea water
(1 mark)

(c) Name TWO mammalian excretory organs other than the kidney.

(2 marks)

5. (a) The left and right ventricles are parts of the heart of a mammal. Name FIVE other parts of the heart.
1. _____
2. _____
3. _____
4. _____
5. _____
(5 marks)

- (b) Give THREE differences between the composition of the blood in veins and in the arteries.

Difference	Blood in the VEINS	Blood in the ARTERIES
1.		
2.		
3.		

(3 marks)

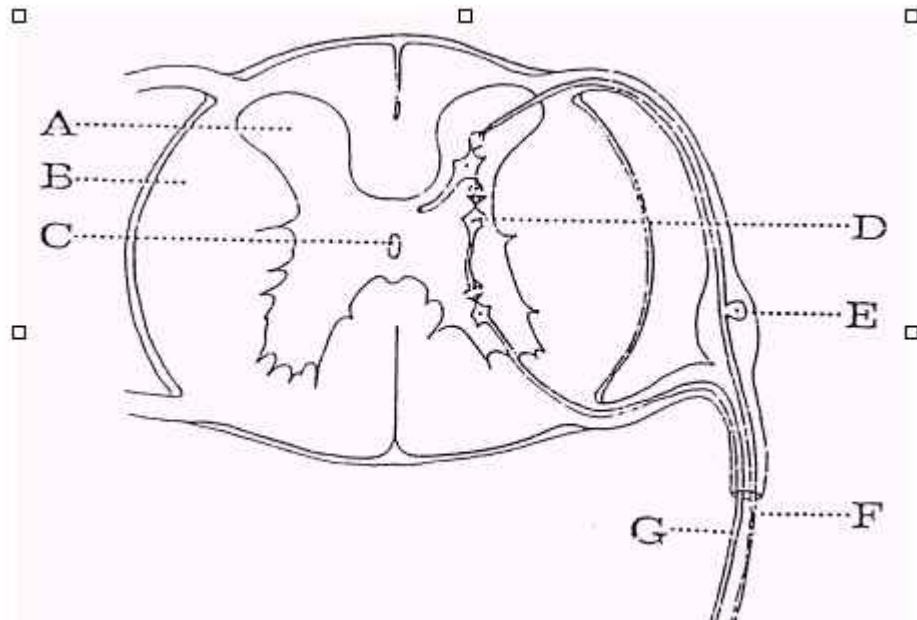
- (c) Explain why the wall of the left ventricle of the heart is thicker than the wall of the right ventricle. (1 mark)

6. Complete the following table:

Name of Hormone	Name of Gland Secreting the Hormone	Where the Gland is Situated in the Body	One Effect of the Hormone
		Next to and above the Kidney	Increases rate of breathing
Testosterone			
			Facilitates release of glucose

(8 marks)

7. The figure below shows a section cut across the spinal cord of a mammal together with the roots of a pair of spinal nerves.



- (a) In the spaces below, give the names of the structures labeled A, B, C, D, E and F.

A: _____ B: _____

C: _____ D: _____

E: _____ F: _____ (6 marks)

- (b) Put arrows besides the structures labelled F and G to show the direction in which a nerve impulse in each travels. (2 marks)

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

Answer Question 1 and any other TWO questions.

1. In the late 1950's, pesticides caused deaths to birds in Britain. In the spring of each year, large numbers of different bird species were found dead. These included a lot of seed-eating birds like woodpigeons, pheasants and partridges. Also predators like hawks, falcons, and foxes.

High levels of a pesticide called dieldrin were found in the bodies. Seeds were often dipped in dieldrin to protect them from pests.

Pesticides like D.D.T. and dieldrin are now banned from most industrialized countries.

- (a) Explain the words pesticide, predators, and pests as described in the passage above. (3 marks)
- (b) Why do you think so many seed-eating birds died? (1 mark)
- (c) How did dieldrin become concentrated in the bodies of predators? (2 marks)
- (d) Why do pests need to be controlled? (1 mark)
- (e) Name TWO farm pests that hinder farmers in their work. (2 marks)
- (f) The pesticides are now banned. Explain this word and suggest what should be the alternative to pesticides. (2 marks)
- (g) For every square metre of grass that it eats, a cow gets 3000 kJ of energy. It uses 100 kJ for growth, 1000 kJ are lost as heat, and 1900 kJ are lost in faeces.
 - (i) What percentage of the energy in one square metre of grass is used for growth? (2 marks)
 - (ii) If beef has an energy value of 12 kJ per gram, how many square metres of grass are needed to produce 100 g of beef? (2 marks)

2. (a) Distinguish between positive and negative tropisms, giving an example of each. (4 marks)
- (b) In what way are tropisms and reflex actions similar? (2 marks)
- (c) What are auxins? (2 marks)
- (d) Describe an experiment, including a control, that you would carry out to show the effect of one-sided lighting on the growth of a young shoot. (7 marks)
3. (a) State briefly the difference between:
- (i). dominant and recessive genes
 - (ii). sexual and asexual reproduction
 - (iii). self and cross pollination
 - (iv). meiosis and mitosis. (8 marks)
- (b) John, who is brown-eyed, marries Ann, who is blue-eyed. They have a brown-eyed son David and a blue-eyed daughter, Mary. David marries Amy who is blue-eyed and have a large family.
- (i) Give the genotype of John and very simply explain the reason for your answer. (2 marks)
 - (ii) Give a simple diagram to show that David and Amy have 50% chance of having brown-eyed children. (4 marks)
 - (iii) State the genotype of all of David's and Amy's brown-eyed children. (1 mark)

4. (a) Write a balanced equation (in words OR symbols), summarizing the process of **aerobic respiration**. (3 marks)
- (b) State THREE differences between aerobic and anaerobic respiration. (3 marks)
- (c) Describe, with the help of a well-labelled diagram, the process of gaseous exchange at the alveoli. (4 marks)
- (d) Describe an experiment you would perform to show that **carbon dioxide** is produced during anaerobic respiration. (5 marks)
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5. (a) What are enzymes? (2 marks)
- (b) State THREE properties of enzymes. (3 marks)
- (c) What are **PROTEINS**? In your answer, describe its composition and its importance. (2, 3 marks)
- (d) Describe an experiment to show the presence of **proteins** in a food substance. (5 marks)