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இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத்
Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department

Department of Examinations, Sri Lanka

අධ්‍යාපන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2012 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திரப் (உத்.தர) பரீட்சை, 2012 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2012

නව නිර්දේශය
புதிய பாடத்திட்டம்
New Syllabus

| | | |
|---|---|---|
| ජීව විද්‍යාව III<br>உயிரியல் III<br>Biology III | 09 E III | පැය තුනයි<br>மூன்று மணித்தியாலம்<br>Three hours |

Index No. : .....

**Instructions:**

* *This question paper consists of 10 questions in 10 pages.*
* *This question paper comprises Part A and Part B. The time allotted for both parts is three hours.*

**PART A — Structured Essay (pages 2 - 9)**

* *Answer all four questions on this paper itself.*
* *Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and extensive answers are not expected.*

**PART B — Essay (page 10)**

* *Answer four questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, tie the two parts together so that Part A is on the top of Part B before handing over to the supervisor.*
* *You are permitted to remove only Part B of the question paper from the Examination Hall.*

**For Examiner's Use Only**

| Part | Q. No. | Marks |
|---|---|---|
| A | 1 | |
| | 2 | |
| | 3 | |
| | 4 | |
| B | 5 | |
| | 6 | |
| | 7 | |
| | 8 | |
| | 9 | |
| | 10 | |
| Total | | |
| Percentage | | |

**Final Marks**

| | |
|---|---|
| In Numbers | |
| In Words | |

**Code Numbers**

| | |
|---|---|
| Examiner | |
| Checked by | 1 |
| | 2 |
| Supervised by | |

[see page two

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## Part A - Structured Essay

*Answer all questions on this paper itself.*

*(Each question carries 10 marks.)*

Do not write in this column

1. (A) (i) The most abundant elements in living matter are given below. Indicate one major form by which these elements are obtained by plants.

| Element | Major form |
|---|---|
| C | ..... |
| H | ..... |
| O | ..... |
| N | ..... |
| P | ..... |
| S | ..... |

(ii) Why are some elements considered as macroelements and some others as trace elements?

.....

.....

(iii) Give two functions of trace elements found in plants.

.....

.....

(iv) Name the four major organic compounds found in organisms.

.....

.....

(v) Water plays an important role in living organisms.

(*a*) Give an example of a biochemical reaction where water acts as a reactant.

.....

(*b*) Give an example where water plays a role in maintaining turgor in plants.

.....

(vi) Give one example for each of the following.

Triose – .....

Pentose – .....

Hexose – .....

Disaccharide – .....

*[see page three*

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(B) (i) What are the three major stages of aerobic respiration? Indicate the site at which each of these stages occur in a living cell.

| Stage | Site |
|---|---|
| ..... | ..... |
| ..... | ..... |
| ..... | ..... |

(ii) What are the major energy carrying chemicals produced during aerobic respiration?

.....

.....

(iii) Aerobic respiration uses other substrates in addition to carbohydrates for energy generation. Name two such major substrates used in aerobic respiration.

(*a*) .....

(*b*) .....

(iv) Briefly indicate how each of the substrates stated in (iii) (*a*) and (*b*) above enters the aerobic respiratory pathway.

(*a*) .....

.....

(*b*) .....

.....

(C) (i) What is meant by classification of organisms?

.....

.....

(ii) Who classified organisms first in a scientific manner?

.....

(iii) State the two methods of classification of organisms.

.....

.....

(iv) What are the main characters used to classify organisms?

.....

.....

(v) Indicate in the relevant cage of the following table whether the characters listed in Column 1 are present (+) or absent (–) in the animals belonging to the taxa given in row 1.

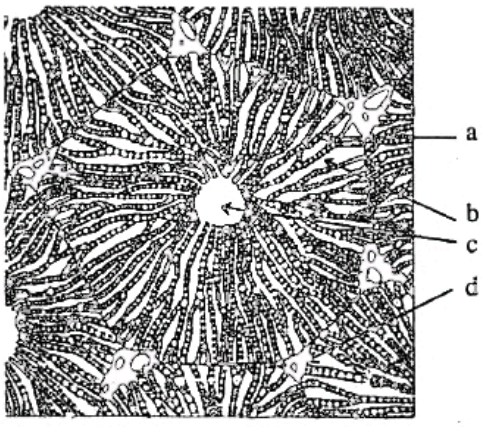
| Character | Insecta | Nematoda | Echinodermata | Mollusca |
|---|---|---|---|---|
| Endoskeleton | | | | |
| Distinct cephalization | | | | |
| Well developed coelom | | | | |

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2. (A)




(i) Identify the histological structure of man shown in the above diagram.

.....

(ii) Name the structures labelled a - d in the above diagram.

a. ..... b. .....

c. ..... d. .....

(iii) State where the following take place in the human alimentary canal.

Digestion of polysaccharides .....

Digestion of polypeptides .....

Digestion of fats .....

Absorption of nutrients .....

Absorption of water .....

(iv) State the features that a respiratory surface of animals should have.

.....

.....

.....

.....

.....

(v) State the respiratory structures that can be seen in the animals belonging to the following phyla.

Platyhelminthes .....

Annelida .....

Arthropoda .....

Chordata .....

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Do not write in this column

(B) (i) What is a respiratory pigment?

.....

.....

(ii) (a) Name a class which includes animals that do not have respiratory pigments.

.....

(b) Why do animals of the class stated in (ii) (a) above have no respiratory pigments?

.....

.....

(iii) Name two disorders of man that are caused due to the abnormalities of respiratory pigment.

.....

.....

(iv) If blood is to be transfused to a person of blood group $B^+$ suffering from one of the disorders stated in (B) (iii) above, blood of which group/groups could be transfused to him?

.....

(C) (i) What are the major structures of plants other than stomata through which transpiration takes place?

.....

.....

.....

(ii) What are the environmental factors that affect the rate of transpiration?

.....

.....

.....

(iii) State the two mechanisms that have been proposed to explain the opening and closing of stomata.

.....

.....

(iv) Explain any one of the two mechanisms stated in (C) (iii) above.

.....

.....

.....

.....

(v) State the three major factors directly responsible for the upward movement of water and solutes in the xylem.

.....

.....

.....

*[see page six*

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Do not write in this column

(vi) Explain why transport of some material across the cell membranes of plants is inhibited by inhibitors of aerobic respiration.

.....

.....

(vii) What is the function of the endodermis in plant roots?

.....

3. (A) (i) What is excretion? Why is it essential for life?

.....

.....

.....

(ii) Name the basic structural unit of excretion of each of the following groups.

Annelids .....

Platyhelminths .....

Mammals .....

Crustaceans .....

(iii) State two advantages of producing ammonia as an excretory product.

.....

.....

(iv) State two advantages of producing urea as an excretory product.

.....

.....

(v) Name the parts in human nephron where bicarbonate ions are reabsorbed.

.....

(vi) State three ions secreted by a human nephron.

.....

(vii) State four functions of human kidney other than excretion.

.....

.....

.....

.....

[see page seven

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Do not write in this column

(B) (i) Name the parts of human brain derived from embryonic fore-brain.

.....

.....

(ii) State three main functions of the nervous system of man.

.....

.....

.....

(iii) What is the most abundant type of cells in the brain of man?

.....

(iv) What is a nerve impulse and why is it not conducted backwards in an axon?

.....

.....

.....

(v) State two functions of each of the following structures of man.

Mid-brain .....

.....

Cerebral cortex .....

.....

Red nuclei .....

.....

Rods of eye .....

.....

Free nerve endings of skin .....

.....

(C) (i) What is homoeostasis?

.....

.....

(ii) What are the hormones involved in osmo-regulation in man?

.....

.....

(iii) What are the essential components of a negative feedback mechanism?

.....

.....

(iv) Name the hormones which increase the blood glucose level in man.

.....

.....

*[see page eight*

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Do not write in this column

(v) State four physiological features common to all muscle types in man.

.....

.....

4. (A) In humans, sex is determined by the pair of sex-chromosomes called X and Y.

(i) What is the genotype of the male?

.....

(ii) What is the genotype of the female?

.....

(iii) When a particular gene is sex-linked on which chromosome is that gene located?

.....

(iv) Colour blindness of humans is a sex-linked inherited condition controlled by a recessive allele. Using symbols X and Y for sex-chromosomes and N and n for the alleles of normal vision and colour blindness respectively, write the genotypes of the following.

| | Genotype |
|---|---|
| Normal male | ..... |
| Colour blind male | ..... |
| Carrier female | ..... |
| Colour blind female | ..... |

(v) Name two human disorders caused due to changes in the chromosome number.

.....

.....

(B) (i) Explain what is meant by the (*a*) habitat and (*b*) niche of an organism.

(*a*) Habitat: .....

.....

(*b*) Niche: .....

.....

(ii) (*a*) What is the international convention associated with the conservation of wetlands?

.....

(*b*) Name three sites in Sri Lanka that are considered to be important under the above convention.

.....

.....

.....

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(iii) Name two main grassland ecosystems in Sri Lanka and state the major difference between those two.

Grasslands : .....

Major difference : .....

.....

(iv) State in which forest ecosystems in Sri Lanka, the following could be seen.

Evergreen trees : .....

.....

Emergent trees : .....

Trees with twisted trunks : .....

Continuous canopy : .....

(C) (i) The most common method of asexual reproduction in plants is vegetative reproduction. Explain what is meant by vegetative reproduction.

.....

.....

(ii) State five types of vegetative reproduction seen in higher plants and indicate one example for each of them.

| Type of vegetative reproduction | Example |
|---|---|
| ..... | ..... |
| ..... | ..... |
| ..... | ..... |
| ..... | ..... |
| ..... | ..... |

(iii) State one advantage and one disadvantage of vegetative reproduction of plants.

Advantage : .....

Disadvantage : .....

(iv) (a) What is meant by plant tissue culture?

.....

(b) What are the constituents of a culture medium generally used in plant tissue culture?

.....

(c) State three advantages of using plant tissue culture techniques.

.....

.....

.....

* *

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