සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved]

இலங்கைப் பரீட்சைத் திணைக்களம் Department of Examinations, Sri Lanka

පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2017 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2017 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2017

ජීව විද්‍යාව II உயிரியல் II Biology II	09 E II	පැය තුනයි மூன்று மணித்தியாலம் Three hours

Index No. : .....

Instructions:

* *This question paper consists of 10 questions in 09 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 - 8)

* *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 9)

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

For Examiners' Use Only

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

Final Marks

In Numbers	
In Letters	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks checked by :	
Supervised by :	

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Part A - Structured Essay

Answer all questions on this paper itself.
(Each question carries 10 marks.)

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1. (A) (i) What are the main functions of water in living organisms other than being a solvent?

.....

.....

.....

(ii) There are many properties of water that are important for life. Of these, some are especially important for aquatic organisms. State three such properties and indicate the role of each of these properties with a suitable example.

(a) Property: .....

Role: .....

.....

Example: .....

(b) Property: .....

Role: .....

.....

Example: .....

(c) Property: .....

Role: .....

.....

Example: .....

(B) (i) State the three concepts of cell theory.

.....

.....

.....

(ii) What are the internal structural features of eukaryotic cells that are different from those of prokaryotic cells?

.....

.....

.....

.....

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(iii) A student was provided with an epidermal peel of onion mounted on a glass slide and a light microscope. State in correct sequence, the steps that should be followed to observe the shape of onion epidermal cells under the light microscope.

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(C) (i) Some structures that can be seen in molluscs are given below.

(a) Head (b) Suckers (c) Two pairs of tentacles
(d) Shell (e) Laterally flattened body

Using the relevant letters, indicate which of the above structures are present in each of the following animals.

Slug : .....

Mussel : .....

Chiton : .....

Octopus : .....

(ii) State two features seen in a heterocercal caudal fin that could be used to distinguish it from a homocercal caudal fin.

.....

.....

(iii) What is a nictitating membrane?

.....

.....

(iv) (a) Name an amphibian which has a long tail during the adult stage.

.....

(b) State a major external feature of the animal named in (a) above which can be used to distinguish it from a lizard.

.....

(v) State a genus of an amphibian which does not have legs during the adult stage.

.....

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2. (A) (i) State three main features that can be seen in a cross section of the human large intestine that can be used to distinguish it from a cross section of the human small intestine, when observed under the low power of a light microscope.

.....

.....

.....

(ii) State two major functions of HCl in the gastric juice.

.....

.....

(iii) Name three hormones that influence selective reabsorption of ions in the human kidney.

.....

(iv) (a) Name an ion which is both reabsorbed and secreted in the human nephron.

.....

(b) Name an ion which is reabsorbed in the human nephron both by active and passive mechanisms.

.....

(v) What is the major constituent of renal calculi?

.....

(B) (i) (a) What is the overall function of the nervous system?

.....

(b) State three features of dendrites that are different from those of axons.

.....

.....

.....

(ii) (a) What is a nerve impulse?

.....

(b) State two factors that affect the speed of conduction of a nerve impulse along an axon.

.....

.....

(iii) (a) Name two inhibitory hormones secreted by human hypothalamus.

.....

(b) What are the functions carried out by human hypothalamus other than the secretion of hormones?

.....

.....

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.....

(iv) In which lobe of the human cerebrum, is the auditory sensory area located?

.....

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Do not write in this column

(v) (a) What is a trophic hormone?

.....

.....

(b) Name the hormone that stimulates the secretion of gastric juice.

.....

(C) (i) (a) What is the overall function of the human blood circulatory system?

.....

(b) What is the most abundant plasma protein in man?

.....

(ii) (a) What is meant by cardiac cycle?

.....

.....

(b) State three factors responsible for maintaining blood pressure of humans within the normal range.

.....

.....

.....

(iii) Name a phylum having triplobiastic animals without a blood circulatory system.

.....

(iv) (a) What happens to the water potential when solutes dissolve in water?

.....

(b) What is turgor pressure?

.....

.....

(v) (a) What is plasmolysis?

.....

.....

(b) How much is the pressure potential of a plant cell at incipient plasmolysis?

.....

(c) State whether the water potential is higher than, lower than or equal to solute potential at incipient plasmolysis of a plant cell.

.....

3. (A) (i) (a) State the two ways by which the most amount of carbon dioxide is transported in human blood.

.....

.....

(b) Where is the respiration control centre located in the human brain?

.....

(ii) What is locomotion?

.....

(iii) (a) State two features that are common to all three types of muscle fibres.

.....

.....

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Do not write in this column

(b) State two features of skeletal muscle fibres which are absent in cardiac and smooth muscle fibres.

.....

.....

(iv) (a) What structural arrangement permits the movement of the human upper arm over a wide range?

.....

.....

(b) State two features seen in the human upper limb that help in weight lifting.

.....

.....

(c) State two features seen in the human lower limb that contribute to erect posture.

.....

.....

(v) State a disadvantage of hydrostatic skeleton.

.....

(B) (i) Name a living plant tissue that provides support.

.....

(ii) State two main substances that are present in the cell walls of the tissue named in (i) above other than cellulose.

.....

(iii) What is parthenocarpy?

.....

(iv) What is parthenogenesis in plants?

.....

(v) Briefly describe seed germination.

.....

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(C) (i) (a) What are the life spans of the human sperm and human ovum?

Sperm : ..... Ovum : .....

(b) At what stage of human spermatogenesis and oogenesis the second meiotic division occurs?

Spermatogenesis : .....

Oogenesis : .....

(ii) (a) What is the role of inhibin in human spermatogenesis?

.....

(b) What is acrosome reaction of a sperm?

.....

.....

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(iii) (a) What is ovulation?

.....

(b) What hormone triggers ovulation?

.....

(iv) Where are the sperm receptors of the human ovum located?

.....

(v) (a) State two functions of oestrogen.

.....

.....

(b) Name a hormone secreted by the human placenta which suppresses myometrial contractions.

.....

(c) What is the role of oxytocin in parturition?

.....

.....

4. (A) (i) (a) What is a test cross?

.....

(b) What is the purpose of carrying out a test cross?

.....

(ii) (a) What is a back cross?

.....

(b) What is the purpose of carrying out a back cross?

.....

(iii) At what condition, a back cross becomes similar to a test cross?

.....

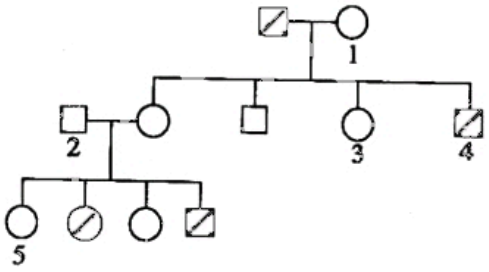
(iv) What is denoted by each of the following symbols in a human pedigree chart?

□ : .....

⊘ : .....

□—○ : .....

(v) A pedigree chart of a human family where some members show a genetic disorder is given below.



(a) State whether the following statement regarding the above inheritance is correct (✓) or incorrect (×).

"The above character is inherited in an autosomal dominant manner." .....

(b) Using 'A' for the dominant allele and 'a' for the recessive allele, state the possible genotype of each of the individuals labelled as 1 – 5 in the above pedigree chart.

1: ..... 2: ..... 3: ..... 4: ..... 5: .....

[see page eight

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(B) (i) State the organizational levels of the environment in correct order.

.....

.....

(ii) (a) What is an extinct species?

.....

(b) Give an example for an extinct bird.

.....

(iii) What are the major objectives of Biodiversity Convention?

.....

.....

.....

(iv) (a) State four main human activities that contribute to desertification.

.....

.....

.....

.....

(b) State three major impacts of desertification on humans.

.....

.....

.....

(C) (i) State the source of carbon and source of energy of each of the following nutritional types seen among microorganisms.

Nutritional type	Source of carbon	Source of energy
Chemoautotrophic	.....	.....
Chemoheterotrophic	.....	.....
Photoautotrophic	.....	.....
Photoheterotrophic	.....	.....

(ii) A student was provided with a clean dry Petri dish. How should it be sterilized to be used in a microbiological experiment?

.....

.....

.....

(iii) State two features of the toxin produced by *Clostridium tetani*.

.....

.....

(iv) Name an enzyme which is industrially produced using *Aspergillus oryzae*.

.....

* *

[see page nine

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ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka
ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
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General Certificate of Education (Adv. Level) Examination, August 2017

ජීව විද්‍යාව	II
உயிரியல்	II
Biology	II

09 E III

Part B - Essay

Instructions:

* *Answer four questions only.*
Give clear labelled diagrams where necessary.
(Each question carries 15 marks.)

5. (*a*) Explain the mechanism of action of enzymes.

   (*b*) Describe the enzymatic reactions of making the first stable product in C_3 and C_4 plants during CO_2 fixation.

   (*c*) Explain how C_4 plants are more efficient than C_3 plants in CO_2 fixation.

6. (*a*) What is transpiration?

   (*b*) State how different external factors affect the rate of transpiration.

   (*c*) Describe how an experimental set-up is arranged to determine the rate of transpiration using a potometer.

7. (*a*) Describe the location of the human testes.

   (*b*) Briefly describe the structure of the human testes.

   (*c*) Briefly explain the process of spermatogenesis in man.

8. Describe the traditional selective breeding techniques that are used by man in agriculture.

9. (*a*) Giving suitable examples, describe the different types of natural resources.

   (*b*) Explain the sustainable use of natural resources.

10. Write short notes on the following.

    (*a*) Human vertebral column

    (*b*) Invasive species

    (*c*) Cyanobacteria

* * *

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