

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2000 අගෝස්තු  
 සම්බන්ධ පොතුවත් තරාතරාපත්තිර(உயர் தர)ப் பரீட்சை, 2000 ஓகஸ்த்  
 General Certificate of Education (Adv. Level) Examination, August 2000

ජීව විද්‍යාව II

உயிரியல் II

Biology II

09

E

II

පැය තුනයි / மூன்று மணித்தியாலங்கள் / Three hours

Index No. : .....

**Important :** \* This question paper consists of 09 pages.

\* This question paper comprises Part A and Part B. The time allotted for both parts is three hours.

**PART A — Structured Essay :**  
(08 pages)

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

**PART B — Essay :**  
(01 page)

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 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**

**For the second paper**

Part	Question Nos.	Marks Awarded
A	1	
	2	
	3	
	4	
B	1	
	2	
	3	
	4	
	5	
	6	
Total		
Percentage		

**Final Marks**

In Numbers	
In Letters	

**Code Numbers**

Marking Examiner	
Marks Checked by	1
	2
Supervised by	

[See page two

**PART A — Structured Essay :**  
*Answer all the questions on this paper itself.*  
*(Each question carries 10 marks)*

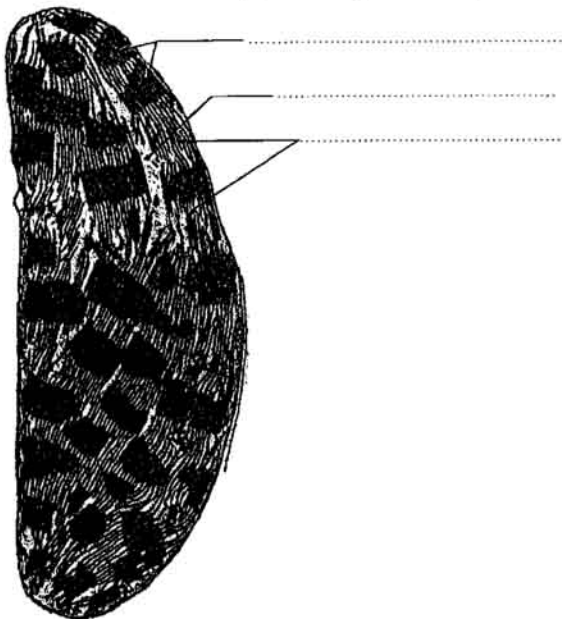
1. (A) (i) What is photosynthesis?

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.....

(ii) What is the global significance of photosynthesis?

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.....

(B) (i) Given below is an electronmicrograph of a chloroplast. Label the parts indicated by arrows.



(ii) In which part of the chloroplast do the (a) light reactions and (b) dark reactions of photosynthesis take place?

- (a) Light reactions .....
- (b) Dark reactions .....

Do not  
write  
anything  
in this  
column

(C) State the major events that take place in the chloroplast during the light reactions.

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(D) The products formed in the light reactions of photosynthesis are used in the synthesis of carbohydrates during the dark reactions. Briefly explain the **three** major stages involved in this process.

- (i) .....
- (ii) .....
- (iii) .....

2. (A) Briefly explain the term 'Biodiversity'.

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(B) (i) What are known as (a) endemic species, (b) keystone species and (c) flagship species?

(a) Endemic species

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.....

(b) Keystone species

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.....

(c) Flagship species

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.....

(ii) Name an animal that can be considered as a flagship species of Sri Lanka.

.....

(C) (i) Name the **five** kingdoms into which the organisms are classified.

.....  
.....

(ii) In naming organisms what is the advantage of using a scientific name against the use of common names?

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(iii) What is binomial nomenclature?

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(iv) What are the international rules followed in the binomial nomenclature?

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(D) (i) State **five** important evolutionary features of flowering plants which enabled them to fully adapt to life on land.

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(ii) State **five** structural features of reptiles which enabled them to fully adapt to a terrestrial mode of life.

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3. (A) (i) What is respiration?

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(ii) State **three** main differences between aerobic and anaerobic respiration.

**Aerobic respiration**

**Anaerobic respiration**

(a)	.....	.....
	.....	.....
(b)	.....	.....
	.....	.....
(c)	.....	.....
	.....	.....

(B) (i) What are the main features that a respiratory surface of an animal should have for efficient exchange of gases?

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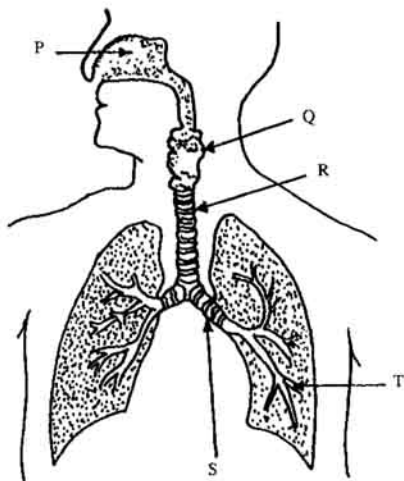
(ii) State **three** respiratory organs seen among invertebrates and name **three** different phyla where each of these organs could be seen.

**Respiratory organ**

**Phylum**

(a)	.....	.....
(b)	.....	.....
(c)	.....	.....

(C) The questions (C) (i) - (iii) are based on the following diagram of the respiratory system of man.



(i) Name the parts labelled as P, Q, R, S and T

- P .....
- Q .....
- R .....
- S .....
- T .....

(ii) State the functions of R.

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.....

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.....

(iii) State a non-respiratory function of Q.

.....

(D) (i) What are known as (a) tidal volume and (b) residual volume of the lungs?

(a) Tidal volume .....

.....

(b) Residual volume .....

.....

(ii) Name the muscles that are involved in the ventilation of lungs in man.

.....

4. (A) (i) Define the following nutritional groups found among organisms.

(a) Chemoautotroph

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(b) Chemoheterotroph

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(c) Photoautotroph

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(d) Photoheterotroph

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(ii) Name an organism or a group of organisms which belong to the following nutritional groups.

(a) Chemoautotroph .....

(b) Chemoheterotroph .....

(c) Photoautotroph .....

(B) (i) Why are some mineral nutrient elements required for plant growth considered as essential elements?

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- (ii) Some of the essential elements are known as macronutrient elements and others as micronutrient elements. Explain.

.....  
.....  
.....

- (iii) List five macronutrient elements and indicate one major function of each of them.

**Macronutrient element**

**Major function**

Macronutrient element	Major function
.....	.....
.....	.....
.....	.....
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- (C) (i) What are the three major pathways through which water movement takes place across a plant root?

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- (ii) Explain briefly the mechanism of movement of water from soil solution into a root hair cell in terms of water potential concept.

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- (iii) How does the movement of mineral nutrients across the plant cell membranes differ from the movement of water?

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- (D) What are the major steps involved in an experiment carried out to determine the water potential of *Colocasia* petiole or potato tissue?

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පියලු ම හිමිකම් ඇවිරිණි]  
முழுப் பதிப்புரிமையுடையது)  
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ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව / இலங்கைப் பரீட்சைத் திணைக்களம் / Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2000 අගෝස්තු  
கல்விப் பொதுத் தராதரப்பத்திர(உயர் தர)ப் பரீட்சை, 2000 ஓகஸ்த்  
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ජීව විද්‍යාව II  
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**Part B — Essay**

Answer four questions only. (Each question carries 15 marks)

1. Describe what happens to a carbohydrate meal ingested by man.
2. (i) What are the major groups of micro-organisms found in soil?  
(ii) Explain the role of soil micro-organisms on plant growth.
3. (i) Describe the structure of the DNA molecule.  
(ii) What is recombinant DNA technology?  
(iii) Explain **two** applications of recombinant DNA technology.
4. (i) Using a flow diagram only show how carbon is cycled in nature.  
(ii) State how man has interfered with the cycling of carbon in nature and explain briefly the environmental impacts of such interferences.
5. (i) Describe the external morphology of the adult and the life cycle of *Necator americanus*.  
(ii) Explain how *Necator americanus* infections could be controlled.
6. (i) Explain what is meant by alternation of generations with reference to the life cycle of *Pogonatum*.  
(ii) State how the form and nutritional status of the gametophyte of *Pogonatum* differs from those of  
(a) *Nephrolepis* and  
(b) flowering plants.  
(iii) Explain how microspores are produced and dispersed in flowering plants.