

සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved

නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

NEW ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
 இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம்
 Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
General Certificate of Education (Adv. Level) Examination, 2020

ජීව විද්‍යාව **II**
 உயிரியல் **II**
Biology II

09 E II

පැය තුනයි
 மூன்று மணித்தியாலம்
Three hours

අමතර කියවීම් කාලය - මිනිත්තු 10 යි
 மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Index No. :

Instructions:

- * This question paper consists of 10 questions in 9 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		

Total	
In Numbers	
In Letters	

Code Numbers	
Marking Examiner 1	
Marking Examiner 2	
Marks checked by	
Supervised by	

Part A - Structured Essay
Answer all questions on this paper itself.
(Each question carries 100 marks.)

Do not write in this column

1. (A) (i) One of the characteristic features of living organisms is irritability. What is known as irritability?

.....
.....

(ii) What is the monomer of each of the following?

Pectin :

Hemicellulose :

(iii) State two common functions of NAD⁺, NADP⁺ and FAD.

.....
.....

(iv) Name the structure that helps in cytoplasmic streaming and movement of chromosomes, and state its structural components.

Structure :

Structural components :

.....

(v) State the location of the secondary cell wall of a plant cell and name a substance present in it other than cellulose.

Location :

Substance :

(B) (i) What are the three events that contribute to genetic variations during meiosis?

.....

(ii) Name the type of photosynthetic pigment that prevents the formation of reactive oxidative molecules harmful to plant cells.

.....

(iii) What is known as the action spectrum of photosynthesis?

.....

.....

(iv) Name the two types of cells in which CO₂ fixation occurs in C₄ plants and state the CO₂ acceptor and CO₂ fixing enzyme present in each of them.

Type of cell	CO ₂ acceptor	CO ₂ fixing enzyme
(a)
(b)

(v) How do the two types of cells stated in B(iv) above interconnect tightly with each other?

.....

(C) (i) In which geological eon did the first eukaryotes appear on earth?

.....

Do not write in this column

(ii) Three events that occurred during evolution of organisms are as follows.

- P - Origin of mammals
- Q - Origin of seed plants
- R - Dominance of angiosperms

Write the above events in chronological order using the relevant letters.

.....

(iii) State three features of free living forms of phylum Platyhelminthes that cannot be seen in parasitic forms.

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

(iv) State where the male and female gametophytes are present in seed plants.

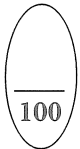
Male gametophyte :

Female gametophyte :

(v) Complete the following dichotomous key to distinguish the protists given below.

Euglena, Paramecium, Amoeba, Ulva, Sargassum, Diatoms

- (1) Cell wall present
Cell wall absent
- (2) Multicellular
Unicellular
- (3) Gas filled floats present
Gas filled floats absent
- (4) Pellicle present
Pellicle absent
- (5) Cilia present
Cilia absent



2. (A) (i) State the three processes that contribute to growth of plants.

.....

(ii) State one function of each of the following plant tissues.

Vascular cambium :

Cork cambium :

(iii) Through which structure, each of the following activities takes place in plants?

Gaseous exchange in woody stems :

Guttation :

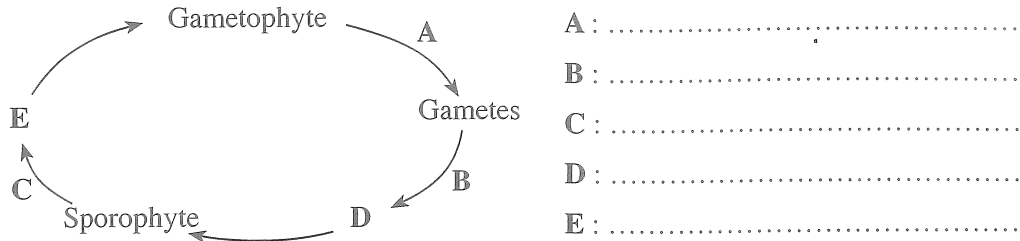
(iv) State in correct sequence what happens in guard cells from the stage of accumulation of K⁺ ions until the opening of stomata.

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

Do not write in this column

(v) How do temperatures below a critical level affect the cell membrane of plant cells?
.....
.....
.....

(B) (i) A sketch of the life cycle of a land plant is given below.
Name the processes denoted by A, B and C and the structures denoted by D and E.



(ii) State the following types of symbiosis.
Beneficial to both organisms :
Beneficial to one organism and no effect on the other :

(iii) (a) Calculate the body mass index of a person who is 153 cm tall and weighs 50 kg.

(b) According to the World Health Organization criteria, what is the minimum weight this person should have in order to consider him as non-malnourished?
(Give your answer in kg to the first decimal)

(iv) Name a fat soluble vitamin that acts as an antioxidant.
.....

(v) Name two hormones that are secreted by the digestive tract of man and have functions antagonistic to each other.
.....

(C) (i) (a) State a common function of epithelial tissues and connective tissues.
.....
(b) State **three** structural features of dense connective tissue that can be used to distinguish it from other connective tissues when observed under the light microscope.
.....
.....
.....

(ii) State the functions of the SA node and AV node of the human heart.
SA node :
.....
AV node :
.....

Do not write in this column

(iii) Draw the normal ECG tracing of a healthy person and label its waves.

(iv) State what are represented by the first and last waves of the ECG tracing.

First wave :

Last wave :

(v) Considering a haemoglobin molecule as 'Hb', write the equation for the chemical reaction that occurs only in the red blood cells of lung capillaries.

.....

100

3. (A) (i) Briefly state what interferons are?

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

(ii) Name two capillary networks that are associated with the human nephron other than the glomerulus.

.....
.....

(iii) What is dialysis carried out for kidney patients?

.....
.....

(iv) State a similarity between nervous coordination and hormonal coordination.

.....

(v) Name two phyla that include animals with brain, ventral nerve cord and segmented ganglia.

.....

(B) (i) (a) What are known as ventricles in the human brain?

.....
.....

(b) What are the three parts of the human brain that form the brain stem?

.....

(ii) State two functions of the human spinal cord.

.....
.....

(iii) What is the importance of refractory period of a neuron?

.....

(iv) Name the progressive motor disorder of the nervous system that leads to lack of coordination and control of muscle movements in elderly people.

.....

Do not
write
in this
column

(v) Briefly state what a hormone is?

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

(C) (i) (a) State **three** functions of Sertoli cells.

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

(b) State the function of acrosome in human sperm.

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

(c) In which structure of the male reproductive system do the sperm mature?

.....

(ii) (a) State **two** methods that can be used to analyze genetic disorders of the foetus during pregnancy.

.....
.....

(b) Write in correct sequence, the pathway that oxygen poor blood of human foetus gets oxygenated and returns to the foetus.

.....
.....

(iii) Name a phylum which includes animals with an endoskeleton made up of calcium carbonate plates.

.....

(iv) (a) Why **doesn't** the first pair of ribs move during inspiration of man?

.....
.....

(b) State **three** structural features of the human vertebral column that help to maintain upright posture.

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

(v) (a) State the function of the arches of the foot of the lower limb of man.

.....
.....

(b) State **two** locations where ball and socket joints are found in the human body.

.....
.....

Do not write in this column

4. (A) (i) State **four** desirable features of garden peas for genetic experiments.

.....

(ii) (a) What is known as pleiotropy in genetics?

.....

(b) Give **two** examples for pleiotropy seen in man.

.....

(iii) What are known as intergenic DNA and introns?

Intergenic DNA :

Introns :

(iv) State whether trisomy, monosomy or gene mutation is the reason for each of the following disorders.

Disorder	Reason
Colour blindness
Down syndrome
Turner syndrome

(v) (a) State why each of the following is used during DNA isolation.

Chelating agent :

Proteolytic enzymes :

Cold ethanol :

(b) State **two** essential features of a cloning vector.

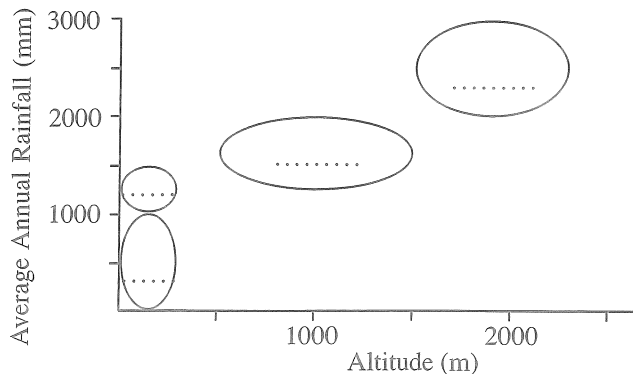
.....

(B) (i) What is meant by primary production?

.....

(ii) (a) Using the correct letter, indicate the ellipse in the diagram that represents each of the following ecosystems of Sri Lanka.

- A - Savanna
- B - Tropical thorn scrubs
- C - Wet patana
- D - Tropical dry mixed evergreen forests



(b) Which one of the ecosystems given in (ii)(a) above can be found in the dry zone as well as in the intermediate zone of Sri Lanka?

.....

Do not write in this column

(iii) Write the common name of an endemic plant found in tropical wet lowland rain forests of Sri Lanka.

.....

(iv) Write the common name of a plant in Sri Lanka which is facing a very high risk of extinction in the wild.

.....

(v) (a) State the group of organisms that contributes most to reduce the CO₂ content in the atmosphere.

.....

(b) What is the major global environmental issue that affects the organisms stated in (v)(a) above?

.....

(C) (i) (a) Name an obligate anaerobic bacterial species.

.....

(b) State the importance of akinetes to cyanobacteria.

.....

(ii) (a) COVID-19 coronavirus is roughly spherical. To which type of morphological form do such spherical viruses belong?

.....

(b) How does a viroid structurally differ from a virus?

.....

(iii) Name two diseases for which immunity can be induced using subunit vaccines.

.....

(iv) Name a species of microorganisms used for the production of each of the following substances.

Citric acid from sucrose :

Invertase :

Streptomycin :

(v) (a) Name two substances that are produced when putrefaction of food occurs due to action of microorganisms.

.....

(b) In routine testing of water samples for consumption, why is the presence of indicator organisms such as coliform bacteria tested instead of the presence of pathogenic microorganisms?

.....

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

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
 திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம்
 Department of Examinations, Sri Lanka இலங்கைப் பரීட்சைத் திணைக்களம் Department of Examinations, Sri Lanka இலங்கைப் பரීட்சைத் திணைக்களம்
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අධ්‍යයන පොදු ඝනකික පත්‍ර (උසස් පෙළ) විභාගය, 2020
 கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
 General Certificate of Education (Adv. Level) Examination, 2020

ඡව විද්‍යාව II
 உயிரியல் II
 Biology II

09 E II

Part B - Essay

Instructions:

- * Answer four questions only.
- Give clear labelled diagrams where necessary.
- (Each question carries 150 marks.)

5. Describe the process of aerobic respiration that occurs in liver cells of man using glucose as the substrate.
6. (a) Describe the effects of light on plants.
 (b) Explain how plants are designed to capture maximum amount of light.
7. (a) Briefly describe the basic structure of the human eye.
 (b) Explain the roles of human eye and brain in vision.
8. Describe the menstrual cycle of women and its hormonal regulation.
9. (a) Briefly describe the applications of microorganisms in agriculture.
 (b) Explain the applications of Polymerase Chain Reaction (PCR).
10. Write short notes on the following.
 - (a) Salt marshes of Sri Lanka
 - (b) Epigenetics
 - (c) Reproduction in Ascomycota

or

Biological control of dengue vector
