General Certificate of Education (Adv. Level) First Term School Based Assessment - January 2026.
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர) முதலாம் தவணை பாடசாலை மட்டக் கணிப்பீடு – ஜனவரி 2026.

Grade 12 (2027)	Biology I	09 | E | I	*Three hours*

Instructions: ** Additional reading time 10 minutes.*

* Answer all questions.
* Write your ***index number*** in the answer sheet provided.
* In each of the question from **1** to **30**, pick one of the alternatives from (1), (2). (3), (4), (5) which is ***correct*** or ***most appropriate*** and ***mark your response on the answer sheet with a cross (X)*** on the number of the correct option. Use blue or black ink pen for your each response.

1) One of the appropriate characteristics of organisms for "control specific physiological, morphological and behavioural chhracters".
   1. Adaptation
   2. Irritability and coordination
   3. Order and organization
   4. Heredity and evolution
   5. Reproduction

2) Can be the appropriate example for adjacent hierarchial levels of organization of the living things
   1. Cellulose, vesel element, xylem, root, plant.
   2. DNA, mitochondria, neuron, brain, nervous system.
   3. ADP, lysosome, leucocyte, blood, heart.
   4. RuBP, chloroplast, mesophyll cell, leaf, plant.
   5. DNA, cellulose, xylem, mesophyll cell, plant.

3) Which one of the following statements is correct regarding carbohydrates?
   1. They are large biological molecules.
   2. They are soluble in water.
   3. They are sugars form from glycosidic bonds.
   4. They contain carbonyl group.
   5. They are branched forms.

4) Correct regarding lipids
   1. Butter is an unsaturated fat.
   2. Only two fatty acids can be found in phospholipid.
   3. Unsaturatd fats are usually solid at room temperature.
   4. They form from phosphodiester bonds.
   5. They are macro molecules.

5) Can be the protein examples form from the interactions between the side chains of a poly peptide chain
   1. Myoglobin and collagen
   2. Albumin and myoglobin
   3. Keratin and albumin
   4. Silk fibre and keratin
   5. Haemoglobin and collagen

6) All the nucleic acids in organisms
   1. are double stranded.
   2. contain either adenine or thymine.
   3. participate in protein synthesis.
   4. can transmit genetic information generation to genertion.
   5. contain both sugars such as ribose and deoxyribose.

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7) Both prokaryotic and eukaryotic cellular organizations have similarity in
   1. having 70S ribosomes in the cytosol.
   2. containing membrane bounded sub cellular components.
   3. evolutionary origin.
   4. having cytosol.
   5. sorounding of cell wall which is a selective barrier.

8) Correct combination regarding sub cellullar components - character - function?

A – Endoplasmic reticulum	P – elongated organelle	W – detoxification
B – Lysosome	Q – vesicle with single membrane	X – production of vesicles
C – Peroxisome	R – hydrolytic enzymes	Y – photorespiration
D – Mitochondria	S – network	Z – exocytosis

   1. B – R – W
   2. C – R – Y
   3. C – Q – Z
   4. A – P – X
   5. D – P – Y

9) Select the correct statement regarding smooth endoplasmic reticulum.
   1. It can manufacture lysosomes.
   2. It is abundantly found in cells which synthesis steroids.
   3. It is a structure which is surrounded by tonoplast.
   4. It involves in digestion.
   5. It functions as a supportive structure in plant cells.

10) Which one of the followings can be an example for communicating junction?
   1. Embryo
   2. Muscle tissue
   3. Heart muscles
   4. Gut epithelium
   5. Skin epithelium

11) When a student observing a cell under the high power of light microscope and said that nucleoluls, centrosomes and nuclear envelope are being seen. The phase of the above cell could be found in
   1. G_1 phase
   2. G_2 phase
   3. S phase
   4. prometaphase
   5. anaphase

12) During prophase I
   1. chiasmata can be seen in the non crossing over points.
   2. crossing over can be occurred inbetween the sister chromatids.
   3. part of the chromosome break and exchange.
   4. the kinetochore of one homologue of homologous pair attach to microtubule from one pole.
   5. chromosomes begin to condence and relax.

13) All the enzymes are
   1. globular proteins.
   2. heat labile.
   3. bilogical catalysts.
   4. specific to the substrate.
   5. co-enzymes.

14) Correct regarding factors affecting the enzymatic functions.
   1. Drugs used against microbes are reversible inhibitors.
   2. When temperature increases above the optimum level chemical bonds of the enzymes get distrupted.
   3. Non-competitive inhibitors donot interrupt enzymatic reactions.
   4. The enzymatic functions would not be affected when alteration in pH below the optimum pH.
   5. When increasing substrate concentration, comptitive inhibition would not be reversed.

[see page 3

15) In the linear electron flow of photosynthesis,

1. reduction of NAD^+ occurs in PS I.
2. water contributetes to neutralize PS I.
3. photo phosphorylation takes place in the PS II.
4. splitting of water occurs in PS I.
5. electrons from PS I neutralise P 680^+.

16) In C4 pathway of photosynthesis,

1. CO_2 is initially fixed in the bundle sheath cells.
2. malate is composed of four carbon atoms, which is the basis for the name of this metabolic path way.
3. PEP carboxylase can exclusively opperates in the bundle sheath cells.
4. phosphoenolpyruvate is actively regenerated.
5. only the enzyme Rubisco is invoved in CO_2 fixation.

17) Under normal conditions, the limiting factor in photosynthesis is

1. Temperature
2. CO_2
3. Light
4. Pollutants
5. Inhibitors

18) Number of ATP molecules produced in substrate level phosphorylation

1. 6
2. 2
3. 4
4. 32
5. 28

19) In the process of ethyl alcohol fermentation,

1. O_2 is released
2. final hydrogen acceptor is acetyl Co-A.
3. substrate level phosphorylation does not coour.
4. NADH is not used.
5. pyruvate releases CO_2 and convert into acetaldehyde.

20) **a** – RNA is accumulated into a vesicle which is surrounded by protein.
b – Another source of organic molecules may have been meteorites.
c – Organic molecules that were in the primitive soup were collected into the protocell.
d – The early genes were RNA and enzymes would have been proteins.
Correct statements of above given regarding biochemical evolution and origin of protocell.

1. Only a and d
2. Only b and c
3. Only b, c and d
4. Only c and d
5. a, b, c and d

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21) Correct sequential order of geological eons

1. Hadean, Proterozoic, Phanarozoic.
2. Archaean, Hadean, Proterozoic, Phanarozoic.
3. Hadean, Archaean, Proterozoic, Phanarozoic
4. Phanarozoic, Proterozoic, Hadean, Archaean.
5. Paleozoic, Mesozoic, Cenozoic.

22) Kigdom / kingdoms which was / were named only by Robert. H. Wittakar?
a – Protista **b** – Animalia **c** – Fungi **d** – Plantae **e** - Monera

1. Only c and e
2. Only a
3. Only a, c and e
4. Only b and d
5. a, b, c, d and e

23) Considered as a common characteristic to two Domains

1. Cell wall component as proteins
2. Growth not inhibited to antibiotics
3. Eukaryotic cellular organization
4. Branched hydrocarbons in membrane lipids
5. One kind RNA polymerase

[see page 4

24) *Nostoc* differs from *Methanococcus* because of

1. containing introns in genes.
2. generating oxygen.
3. being a multicellular organism.
4. being a eukaryota.
5. lives in extreme environments.

Directions summarized for questions 25-30.				
1	**2**	**3**	**4**	**5**
(A), (B), (D) Correct.	**(A), (C), (D)** Correct.	**(A), (B)** Correct.	**(C), (D)** Correct.	Any other responses or combination of responses Correct.

25) Electron microscopes

A) have resolution power of $0.2nm$.
B) use simple magnets to focus beam of electrons.
C) can be used to observe internal structures or surface view.
D) pruduce images which can be observed by micrographs.
E) use heavy metals or stains to observe samples.

26) Correct statement / statements regarding structure and functions of plasms membrane of animal cells.

A) Cholesterol molecules randomly integrated into the phospholipid bilayer.
B) Phospholipds are amphoteric molecules.
C) Some protein molecules found in plasms membrane act as a receptor molecule for interacting with hormones.
D) Most of the integral proteins are transmembrane proteins.
E) Its mainly composed of proteins, phospholipids and carbohydrates.

27) Correct statement / statements regarding extra cellular matrix of animal cells.

A) Most abundant glycoprotein is collagen.
B) Collagen fibres are connected to the integral proteins of plasma membrane.
C) Network is found woveenout by fibronectin.
D) Linked with cytoskeleton.
E) Does not involve in the cell behaviour.

28) In plants, galls

A) occurs due to uncontrolled meiotic division.
B) occurs due to the maintanence of proper balance between auxin and cytokinin.
C) are the bumps and growths that develop on different parts of plants.
D) occurs due to insect attacks.
E) can spread to locations distant from their original site by metastasis.

29) Which of the following statement / statements is / are correct regarding ATP?

A) It contains carbohydrate.
B) It can carry energy anywhere in the cell for any energy consuming reaction.
C) When it is hydrolyzed, yield 30.5 kJ energy.
D) It can be produced within living cells.
E) It's a nucleoside.

30) Correct characteristic / characteristics regarding all multicellular Protists.

A) Marine habited B) Containing cell wall C) Thallus
D) Can be seen to naked eye E) Contains chlorophyll a

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Grade 12(2027)	Biology II	09	E	II	Index Nº: ……..……

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

Instructions:

- This question paper consists of **06**questions in **09**pages.
- This question paper - **Part II** comprises Part **A** and **B**. The time allotted for **both parts and Part I** is **three hours**. (Additional reading time is **10 minutes**)

Part A – Structured essay (Pages 2 – 08)

* Answer **all three** 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 09)

* Answer **two** 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 take only **Part B** of the question paper from the examination hall**.**

✓ For examiners' use only

Part	Question. No	Marks
A	1	
	2	
	3	
B	4	
	5	
	6	
Total		

Total Marks

In Numbers	
In Letters	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks Checked by	
Supervised by	

[see page 2

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Part II A – Structured Essay

❖ **Answer all questions in this paper itself.**

(Each question carries 100 marks)

1. A. i. What is sustainable food production?

……

……

ii. How food production can be sustainably maintained, which are based on knowledge in biology?

……

……

……

iii. Name a disease in Sri Lanka, recently has become a serious health problem.

……

iv. What is reproduction?

……

v. Which property of water will function as thermal buffer in living system and aquatic bodies?

……

vi. What is the common characterstic to all monosaccharides and some disaccharides?

……

vii. Indicate the pentose sugars and give a function of each of them.

…… ……

…… ……

…… ……

B.

i. Draw in the provided space below, how a triacylglycerol molecule form from a glycerol molecule and fatty acids.

[see page 3

Do not write in this column.

ii. a. Which are the molecules form the hydrophilic head of a phospholipid?

……...

b. Indicate the elemental composition of the following molecules.

1. Ovalbumin ……..

2. NAD^+ ……

iii. Indicate the structural type of proteins which act as functional stage protein and indicate **one** example for each of them.

…… ……

…… ……

iv. Which are the chemical substances used in the experiment to know the presence of proteins in a food substance?

……

C.

i. Briefly give the formation of a polynucleotide chain.

……

……

……

ii. a. What is anti-parallel in DNA molecule?

……

……

b. Indicate the functions of DNA molecule.

……..

……

……

……

iii. What are the functions of FAD which is a co-enzyme?

……

……

iv. Give the usual values of maximum magnification and resolution power of a light microscope.

Magnification ……..

Resolution power ……

100

[see page 4

2

Do not write in this column.

A. i. What is the major difference between transmission electron microscope and scanning electron microscope regarding the way of obtaining the image of the specimen?

.....

……

ii. All the cells share certain basic features. Indicate them

……

……

……

……

……

iii. a. Which cell structure act as the outer limit of cytoplasm?

……

b. In which name, the above-mentioned structure's model is named in iii. a?

……

iv. a. Indicate **two** structural characteristics of both organelles, mitochondria and chloroplast.

……

……

b. Name a major molecule which is synthesized by both mitochondria and chloroplast.

……

v. Indicate a subcellular component for the following functions.

a. Manufacturing cellulose ……..

b. Involves in detoxification ……

c. Synthesizing glycoproteins ……..

vi. Name the cytoskeletal components and indicate the protein sub unit forms each of them.

Cytoskeletal components	**protein sub unit**
…….	…….
…….	…….
…….	…….

B. i. Which is the common structural character of both centriole and basal body?

……

[see page 5

ii. Which are the components of central vacuole of a plant cell?

……

……

iii. a. What is the location of the secondary cell wall of a plant cell?

……

……

b. Which substances present in the secondary cell wall of a plant cell?

……

iv. a. What is cell junction?

……

b. Which type of cell junction found in the human skin epithelium?

……

v. Which component forms the network that the collagen fibres are embedded in the extra cellular matrix of animal cells?

……

C. i. a. What is cell cycle?

……

……

b. In which phases, the cell cycle controlling check points are found?

……

c. Indicate how some cells enter into the G_O phase.

……

……

d. Name **two** cell in the human body which are at G_O phase.

……

ii. Indicate the mitotic phase for each of the following events.

a. Formation of mitotic spindle ……

b. Separation of sister chromatids ……

c. Each chromosomes get attached to the kinetochore microtubule at their centromere

……

iii. What is the significance of mitosis regarding the formation of daughter cells genetically identical to parental cells at the end of the cell division?

……

Do not write in this column.

100

[see page 6

Do not write in this column.

3. **A.** i. Give the steps of energy relations of living system on biosphere.

……

……

……

……

……

……

ii. Briefly explain how ATP release energy into the cells.

……

……

……

iii. a. Of which effect, the specificity of an enzyme?

……

b. How is an enzyme catalyzed reaction affected when the temperature increases above the optimum level?

……

……

……

……

……

……

B.

i. Which are the global importances of photosynthesis related to atmosphere?

…..……..

……...

…..……..……

ii. a. What is Kranz anatomy?

……..

……

b. For efficient functioning, which is the special characteristic that found between mesophyll cells and bundle sheath cells in C4 photosynthetic path way?

……...

iii. a. Which molecule is produced from the reduction in glycolysis?

……

b. To which, the above-mentioned molecule in iii. a. is utilized in ethyl alcohol fermentation?

……..

c. Which is the specific site where the link reaction of cellular respiration takes place?

……

[see page 7

Do not write in this column.

iv. To which molecule, the electrons released from oxidation of reduced coenzymes in aerobic respiration, reaches?

……

v. a. What is respiratory quotient?

……...

……...

b. What is the respiratory quotient value when fats are utilized as respiratory substrate in cellular respiration?

……

C. i. Write in correct sequence, the main stages by which the first cells have been produced to the theory of biochemical evolution.

……

……

……

……

……

……

ii. About how many years after, the origin of photosynthetic organisms did oldest protist originate?

……..

iii. During the evolution of biodiversity, about how many years ago would each of the following have occurred?

a. Colonization of land by fungi, plants and animals.

……

b. Formation of earliest tetrapods evolved from lobed-fined fish.

……

iv. Which is the evolutionary hypothesis that includes Mendelian genetics as the basis for biological inheritance?

……

v. Briefly describe the **two** events which were observed by Charles Darwin in the environment.

……..

……..

……..

……..

vi. Write the hierarchy of taxa, the number of individuals in the taxon increases.

……

……

[see page 8

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Do not write in this column.

vii. a. Indicate a Protist genus which is a heterotroph and not contains pellicle

……

b. Indicate a Protist genus which consist of cellulose in the cell wall and laminarin as storage food.

……

c. Which protist contains photosynthetic pigments such as chlorophyl a, c, carotene and xanthophyll?

……

100

**

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Grade 12 (2027)

09	E	II

Biology II

Part B - Essay

Instructions:

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

4. Describe the reduction division of meiosis.

5. a. Briefly describe the photosystems of chloroplasts of C4 plants.

   b. Explain the calvin cycle in C4 plants.

6. Write short notes on the followings:

   a. Nucleotides

   b. Cilia and flagella

   c. International codes of binomial nomenclature

***

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