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Provincial Department of Education, Northern Province.
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Grade 12 (2026)	Biology I	09 E I	Three hours

* *Additional reding time 10 Minutes*

Instructions:

* Answer all questions.
* Write your ***index number*** in the answer sheet provided.
* In each of the question from **1** to **50**, 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 in accordance with the instructions given on the back of the answer sheet.

01. Physical property of water that prevent organisms from over heating
    1. Expansion upon freezing.
    2. High heat of vaporization.
    3. High specific heat.
    4. Cohesion.
    5. Polarity.

02. Correct statement regarding RNAs
    1. tRNA is a nucleic acid with double strand.
    2. mRNA stores the genetic information of an organism.
    3. They are made up of four types of ribonucleotides.
    4. They can function as coenzymes.
    5. There are two hydrogen bonds found between adenine, which is purine type and thymine, which is pyrimidine type.

03. Eukaryotic cellular organization differs from prokaryotic cellular organization because of
    1. possessing a DNA which is linear.
    2. subcellular components are suspended in the cytosol.
    3. evolved from prokaryotes around 1.8 million years ago.
    4. consists of some nitrogen fixing cells.
    5. containing flagella.

04. In animal cell shape is maintain by
    1. extra cellular matrix
    2. desmosome
    3. cell wall
    4. central vacuole
    5. cytoskeleton

[see page 2

Past Papers Wiki

05. In plants, haploid spores are formed

1. at the end of meiosis I
2. at the end of the cytokinesis of meiosis I.
3. at the end of meiosis II
4. at the end of the cytokinesis of meiosis II.
5. at the end of the cytokinesis of mitosis.

06. a. macro molecule b. active site c. heat sensitive
d. globular proteins e. not being used up during the reaction

Of the above characteristics, found in all enzymes

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

07. Correct statement regarding Kingdom Fungi.

1. All the members of Ascomycota possess a terrestrial habitat.
2. Zygosporangium of Zygomycota are produced due to plasmogamy and karyogamy.
3. Basidiomycota produce fruiting bodies called basidiocarp.
4. All the Chytridiomycota possess coenocytic hyphae.
5. All the kingdoms of Fungi show both sexual and asexual reproductive methods.

08. Sporophylls

1. are found in all the phyla which possess dominant sporophyte generations.
2. are arranged in the strobili of both club mosses and spike mosses.
3. are leaves that bear sporangia.
4. contain sori on its surfaces.
5. are not found in seed plants.

09. Consider the following statements regarding animals of phylum Cnidaria.

(i) They reproduce by only asexual methods.

(ii) There is an acellular layer found between two body cell layers.

(iii) They have a gastrovascular cavity with a single opening which is surrounded by endoderm.

Correct of the above stated.

1. Only (i)
2. (i) and (iii)
3. (ii) and (iii)
4. (i), (ii) and (iii)
5. Only (iii)

10. Which one of the following statements is correct regarding the meristems of plants?

1. In woody plants, lateral meristems are involved in the increment of circumference of stems and roots.
2. In grasses there are apical meristems, lateral meristems and intercalary meristems.
3. Only the primary growth occurs due to meristematic cells.
4. Only the bark is produced by the lateral meristems.
5. Unlike seeds, meristematic cells do not have dormancy.

[see page 3

11. Diffusion
    1. does not occur via membranes.
    2. occurs at much lesser speed than bulk flow.
    3. indicates that the adsorption of water molecules by cellulose cell wall.
    4. is not a directional movement of population of molecules.
    5. participates in the movement of solutes across the membrane.

12. Elements that show deficiency symptoms such as weak stems, thick leathery and discoloured leaves and light green colour throughout young leaves respectively

    1. K, S, P 2. Cl, Fe, Cu 3. Ca, Mg, Zn 4. K, B, Cu 5. N, B, Mn

13. a. Formation of lignin b. Waxy cover c. Salt glands
    d. Enzymes that degrade cell wall e. Abscisic acid

    Which of the above are the defences against fungi and bacteria?

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

14. Which one of the following statements is correct regarding seed plants?
    1. Gametophytes of seed plants are monoecious.
    2. Endosperm of seed plants is developed from the polar nuclei of central cell of embryo sac.
    3. Seed plants do not contain flagellated sperms.
    4. Integument protects the megasporangium in seed plants.
    5. Gametophyte of seed plants can be seen through the naked eyes.

15. A location in human, where the epithelium performs secretion

    1. nasal cavity 2. kidney tubules 3. alveoli of lungs
    4. trachea 5. buccal cavity.

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16. a. Trypsin b. Pancreatic carboxypeptidase c. Amino peptidase d. Pepsin

    Enzyme / enzymes that gives / give two different types of absorbable end products of protein digestion

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

17. Main minerals for each of the following functions such as maintain acid base balance, help nerve function and maintenance of tooth structure respectively

    1. Na, K, Ca 2. Cl, Na, P 3. I, Fe, F
    4. K, Ca, F 5. Mg, K, Na

[see page 4

18. In which pair / pairs where **(i)** happens in the effect of (**ii)**

A. (i) Blood flows passively through to the ventricles.

(ii) Atrio ventricular valves open during the complete cardiac diastole.

B. (i) Ventricular systole.

(ii) Transmission of electrical impulses in the myocardium from the apex of the heart upwards.

C. (i) Emptying the atria.

(ii) The electrical impulses generated in the SA node, trigger a wave of contraction that spread over the myocardium of both atria.

1. Only A 2. Only B 3. A and C 4. A and B 5. Only C.

19. To maintain a steep diffusion gradient, a respiratory surface

1. must be permeable.
2. must be wet.
3. must be thin.
4. should possess a large surface area.
5. should possess a good blood supply.

20. Which one of the following statements is correct regarding human respiratory system?

1. Main respiratory centre is found in thalamus.
2. Air is pulled during inspiration due to a positive pressure.
3. Surfactant that coated the alveoli prevents the collapse by lower the surface tension.
4. Cilia are not found in the alveoli.
5. Mucus escalator helps the exhalation of air from the lungs.

21. Antibodies

1. possess epitopes.
2. are secreted by T lymphocytes.
3. are surrounded by plasma membrane.
4. engulf pathogens.
5. are antigen receptors of B lymphocytes that are secreted.

22. Excretory structure of the terrestrial Arthropods

1. contains cilia.
2. contains a capillary network.
3. is the body surface.
4. opens one end into the digestive tract.
5. is a multi-cellular structure that opens both sides.

[see page 5

23. a - Anti bodies produced in horses are used to develop artificially acquired active immunity.

b - Naturally acquired passive immunity can be developed in a foetus.

c - Artificially acquired active immunity can cause the secondary immune response.

d - Memory T cells are involved in the development of naturally acquired passive immunity.

Correct regarding the above stated.

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

24. Correct statement regarding nitrogenous wastes of animals

1. Birds mainly excrete urea.
2. No need of water to excrete uric acid.
3. More energy is spent to excrete uric acid.
4. Some organisms excrete ammonia without any energy expenditure.
5. Skates excrete ammonia which they use for the osmoregulation.

For each of the questions 25 to 30, one or more of the responses is/are correct. Decide which response/responses is/are correct and then select the correct number.

If only (A), (B) and (D) are correct…… (1)

If only (A), (C) and (D) are correct ……..... (2)

If only (A) and (B) are correct ……... (3)

If only (C) and (D) are correct…… (4)

If any other response or combination of responses is correct……. (5)

Directions summarized				
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. Which of the following statement / statements is /are correct regarding photosynthesis?

A. ATP can be synthesized in bundle sheath cells.

B. Glucose can be synthesized in both mesophylls and bundle sheath cells.

C. PS I can absorb light in the wave length of 650 nm.

D. $NADP^+$ reductase is needed for the cyclic electron flow.

E. Primary electron acceptors are found in the light harvesting complexes of photosystems.

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Past Papers Wiki

26. During lactic acid fermentation,
    A. carbon dioxide molecules are not released.
    B. final electron acceptor is acetyl Co -A.
    C. the first step is glycolysis.
    D. most common organisms involved are lactic acid bacteria.
    E. two lactic acid molecules are formed from a pyruvate molecule.

27. Characteristic / characteristics to both animals of Mollusca and Arthropoda
    A. Chitin in body parts.
    B. Open circulation.
    C. Segmented body.
    D. Hemocyanin.
    E. Bilateral symmetry or asymmetry.

28. Gibberellins
    A. promote movement of nutrients inti sink tissues.
    B. regulate cell division.
    C. stimulate stem elongation.
    D. stimulate fruit growth.
    E. regulate development of fruit.

29. Human stomach
    A. contributes to nonspecific defence.
    B. performs absorption function.
    C. secretes pepsin by chief cells.
    D. acts as a target site for an enzyme.
    E. consists of permanent circular folds.

30. To which person / persons of blood group, a donor with blood group B Rh^+ can donate blood?
    A. B Rh^-
    B. A Rh^+
    C. AB Rh^+
    D. B Rh^+
    E. AB Rh^-

**

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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 **07** questions in **11** pages.
- This question paper - **Part II** comprises Part **A** and **B**. The time allotted for **both parts** is **three hours**.

Part A – Structured essay (Pages 2 – 10)

- 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 11)

- 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. (**Detach it** ✂)

✓ **For examiners' use only**

Part	Question. №	Marks
A	1	
	2	
	3	
	4	
B	5	
	6	
	7	
Total		

Total Marks

In Numbers	
In Letters	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks Checked by	
Supervised by	

[see page 2

Part II A – Structured essay

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

(Each question carries 100 marks)

Do not write in this column.

1. A. i. Indicate **one** organism which has an arboreal habitat.

……..

ii. What is metabolism?

……

……

iii. What is the biological importance of expansion upon freezing, one of the physical properties of water?

……

……

iv. Indicate in which group of organisms, the followings can be stored.

a. Starch …….

b. Glycogen …….

v. How Trans unsaturated fats differ from Cis unsaturated fats?

……

vi. Briefly indicate the pairing up of nitrogenous bases in a DNA molecule.

……

……

vii. Name the model that put forward to explain the plasma membrane.

……

viii. a. Which components are found in the nuclear matrix?

……

b. What is the location of nuclear lamina?

……

B.

i. a. Which subcellular component produces lysosomes?

……

b. Indicate **two** characteristics which could be shared by both lysosomes and peroxisomes.

……

……

[see page 3

c. Indicate **two** functions carried out by lysosomes and peroxisomes respectively.

Lysosome……

……

Peroxisome……

……

Do not write in this column.

ii. When examining a stained temporary preparation of onion root tip under light microscope, a student observed cells with each chromosome is attached to the centromere by microtubules. In which phase of the mitosis could those cells be?

……

iii. How cytokinesis of meiosis I differs from cytokinesis of meiosis II?

……

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

……

……

……

v. Which is the exact location of Calvin cycle to be occurred in C4 plants?

……

vi. Which is the enzyme catalysing the carbon fixation at the location stated above in v.?

……

vii. Indicate the reactants and stable products by an equation for the above mentioned catalysing in vi.

……

C.

i. Which are the areas that provided experimental evidences for the appearance of first living cells on earth?

……

……

ii. Briefly explain the events which could be observed by Darwin in the environment.

……

……

……

……

[see page 4

iii. How should be the species name of the two related species?

……

iv. a. In which instance a third word can be used in the binomial nomenclature?

……

b. Write such a name you mentioned in the above iv. a.

……

Do not write in this column.

100

2 A i. State **three** structures of tuna that can be seen externally, which are the characteristic features of class Osteichthyes.

……

……

……

ii. Name **two** photosynthetic pigments that cannot be seen in *Ulva* and can be seen in *Gelidium*.

……

iii. a. Indicate **two** phyla which include animals that do not possess specialized excretory system.

……

b. Name the animal phylum / phyla for each of the following excretory structure.

Flame cell ……

Nephridia ……

iv. Which are the chordate classes that show both internal and external fertilization?

……

B. i. Indicate **two** types of cells in ground tissue which could be living even at functional maturity.

……

ii. Indicate the location of cuticle and its main function in plants.

Location ……

Function ……

iii. a. What is bark?

……

[see page 5

b. Name the main conducting component in the bark.

……

c. How soft wood is mainly differing from hard wood?

……

iv. Indicate **one** characteristic of plant leaves which grow in the following environments to capture maximum light.

a. Plants grow in low light conditions

……

b. Plants grow in rain forests

……

v. How the energy is required in guard cells for the accumulation of K^+?

……

……

vi. a. Indicate **two** sites where abscisic acid is produced in plants.

……

b. Indicate **three** events which could be promoted by abscisic acid in plants.

……

……

C. i. Indicate **two** functions of magnesium in plants.

……

ii. Indicate **two** phyla which consist of plants depend on external water for fertilization and **two** phyla which consist of plants **not** depend on external water for fertilization and both plant phyla have dominant saprophytic generation.

Phyla which consist of plants depend on external water for fertilization:

……

Phyla which consist of plants **not** depend on external water for fertilization:

……

iii. How stamens and carpels found in angiosperms are named in gymnosperms respectively?

Stamens……

Carpels ……

Do not write in this column.

[see page 6

Past Papers Wiki

iv. What is self-pollination?

.....

.....

v. Indicate **two** special types of adaptations of flowers for cross pollination other than colour and odour.

.....

.....

Do not write in this column.

100

3. **A.** i. Which are the characteristics of epithelial tissues of animals?

.....

.....

.....

ii. Indicate the epithelial type of the followings found in the digestive system in man.

a. Intestinal lining.....

b. Lining of mouth.....

c. Lobule of liver .....

iii. What is assimilation?

.....

iv. Name **two** antimicrobial substances that could be found in saliva.

.....

v. What is the function of pyloric sphincter?

.....

vi. Indicate **three** functions of human rectum.

.....

.....

.....

B.

i. Indicate the functions of cholecystokinin and secretin when chyme rich in fatty acids and amino acids.

Cholecystokinin .....

.....

Secretin .....

.....

[see page 7

Do not write in this column.

ii. What is protein sparing?

……

……

iii. Using a labelled diagram, indicate the direction of blood flow in a single circulation of a tuna fish.

iv. Indicate the correct pathway through which a red blood corpuscle in the superior vena cava reaches the aorta.

……

……

v. Indicate a respiratory pigment that **cannot** be transport oxygen from a respiratory surface and give a function of it.

……

……

vi. Name the **three** layers of tissues of the heart wall from outermost to inner most.

……..

vii. What is represented by the final wave in an ECG?

……..

C. i. Show the sequence of blood clotting process in man using a flow chart, in the space given below.

[see page 8

ii. Indicate **two** functions of ions which could be found in blood plasma.

……

……

iii. What is stroke?

……

……

……

v. Briefly describe the impacts of a mother of blood group Rh^- bears a child of Rh^+, and if she is pregnant for the second time with a Rh^+ foetus.

……

……

……

……

v. Indicate **three** characteristics of the respiratory surface in human other than the good blood supply.

……

……

……

Do not write in this column.

100

4. A i. Indicate an example animal which processes coelom along with each of the following respiratory structures.

a. External gills ……

b. Body covering ……

c. Book lung ……

ii. Indicate the membranes which surrounds the human lungs and their exact location.

…… ……

…… ……

iii. What is the structural adaptation of tracheal air ways to keep open?

……

iv. a. Indicate the parts of the brain that regulate homeostatic control of breathing in man.

……

b. Which are the locations of sensors that could detect pH changes?

……

[see page 9

Do not write in this column.

v. Briefly describe the effects of CO in tobacco smoke.

……

……

……

vi. How silicosis occurs?

……

B.

i. a. Inspiratory reserve volume, tidal volume and expiratory reserve volume of a healthy human are 2500 ml, 500 ml and 1550 ml respectively. The total lung capacity of than person is 5750 ml. What would be the residual volume value of that person?

……

b. What would be the value of functional residual capacity of the above person?

……

c. What are the importances functional residual capacity?

……

……

ii. Briefly describe the role of mucus membrane of innate immunity which could be found in the human respiratory tract.

……

……

……

iii. a. Indicate **two** locations where natural killer cells found in the human body.

……..

……

b. Indicate **two** cell types which are destroyed by natural killer cells.

……

……

iv. Which cause pain, one of the symptoms of inflammatory response?

……

……

v. What is secondary immune response?

……

……

[see page 10

Past Papers Wiki

C i. What is osmoregulation?

……

……

ii. Indicate the final excretory products if carbohydrates are metabolised within the cells and they are subjected to aerobic and anaerobic respiration.

Aerobic respiration……

Anaerobic respiration ……...

iii. a. What is green gland?

……

……

b. Which animal group possess green gland?

……

iv. Indicate the location of human the kidneys.

……

……

……

……

v. What is the function of ureter?

……

vi. Indicate the location in the human nephron where only water is reabsorbed and water is **not** reabsorbed.

Location where only water is reabsorbed

……

Location where water is **not** reabsorbed

……...

Do not write in this column.

100

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Grade 12 (2027)	09	E	II	Biology II

B. Essay

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

5. a. Describe the role of photo systems in the light dependent reactions of photosynthesis.

   c. Briefly describe the absorption of nutrients in the human small intestine.

6. a. Briefly describe on hypertension and hypotension.

   b. Briefly describe the ventilation mechanism in human lungs.

7. Write short notes on the followings:
   a. Five kingdom system of biological classification
   b. Guttation
   c. Antigens

***

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