



FWC

G.C.E. A/L Examination March - 2019

Conducted by Field Work Centre with
Provincial Department of Education, Northern Province.

Grade: - 12 (2020)

Biology

Time: - 3.00 Hours

Part I

❖ Answer all questions.

- 1) Which of the following hierarchy level **does not** consist a biological component only?
1. Tissue
 2. Organ
 3. Eco system
 4. Community
 5. Population
- 2) Which of the following options is **incorrect** regarding the properties of water in maintain the existence of life on earth and its features related to that function?

Main properties

1. Cohesive behaviour
2. Cohesive behaviour
3. Ability to maintain moderate temperature.
4. Expansion upon freezing
5. Versatility as a solvent

Functions

- Presence of water surface as a habitat for water – skater.
- Occurrence of mass transfer through sieve tube along the gravity.
- Occurrence of great variation of the body - temperature of cold – blooded organisms when the environmental temperature changes.
- Water in water – reservoirs remaining without freezing completely during cold seasons.
- Dissolving of organic protein molecules like Lysozyme.

- 3) Which of the following statements is correct regarding NAD^+ ?
1. It is a Nucleoside type compound.
 2. It is able to be a reducing agent in cellular respiration.
 3. It is found only in the matrix of mitochondria.
 4. It functions as an energy carrier when it is reduced.
 5. A component of this forms when derivative of Vitamin B_2 joins with the Ribose sugar.
- 4) Which of the following statements is **incorrect** regarding the proteins?
1. C, H, O, N and S are found in proteins.
 2. There is a quaternary structure found in Myoglobin.
 3. The β -pleated sheet forms the core of the most tertiary structured globular protein.
 4. Albumin is the plasma protein that founds abundantly in human blood.
 5. The quaternary structure forms when two or more polypeptide chains join together to form a functioning protein.

- 5) Which of the following statements is **incorrect** regarding ribosome?
1. All Ribosomes consist two subunits.
 2. 70S type Ribosomes found in both Prokaryotes and Eukaryotes.
 3. 70S ribosomes occur into two forms such as free and bounded.
 4. Proteins and r RNA are found in the subunits of Ribosome.
 5. Ribosomes are not considered as organelles as they are not covered by a membrane.
- 6) Which of the following statements is **incorrect** regarding mitosis?
1. Mitosis does not occur when the gamete formation in animals.
 2. It is not possible to observe chromosomes during inter-phase.
 3. The cell expansion takes place in pro metaphase by the expansion of non – kinetochore microtubules.
 4. Mitosis occurs in plants during the formation of gametes in plants.
 5. The sister chromatids are separated by the disintegration of cohesion- protein during anaphase.
- 7) Which one of the following statements is correct regarding ATP?
1. It is a compound of three Nucleotides.
 2. ATP is needed when absorbing K^+ from soil solution to root hair cells.
 3. 30.5 kJ energy is released when an ATP molecule is converted into ADP.
 4. Phospho fructo kinase enzyme helps in converting ATP into ADP + Pi [ATP \longrightarrow ADP + pi]
 5. ATP formed due to photo phosphorylation is released in the membrane space of Thylakoid of chloroplast.
- 8) Which of the following statements is **incorrect** regarding enzymes?
1. Enzymes reduce the activation energy for enzyme reaction.
 2. The drugs used against HIV which inhibits Protease, are the non-competitive inhibitors which inhabits the formation of new virus.
 3. Allosteric regulators inhibit or activate enzyme reaction as they join by non – covalent bonds.
 4. Allosteric enzymes usually made up of two or more subunits.
 5. The end product functions as an inhibitor or activator in feedback inhibition.
- 9) In anaerobic respiration,
1. ATP is formed by the oxidative phosphorylation.
 2. NAD^+ is not regenerated.
 3. It takes place in cell organelles like Mitochondria only.
 4. Electron transport chain takes place in fermentation as anaerobic respiration.
 5. Water is formed as an end product in some bacteria during anaerobic respiration.
- 10) Which of the following statements is correct about C_4 photosynthesis.
1. RuBP is the main CO_2 acceptor in Mesophyll cell.
 2. The grana of chloroplast of Mesophyll cells found well rudimental.
 3. Bundle sheath cells lack PSII mostly.
 4. The HCO_3^- concentration in cytosol of bundle sheath cell is high in concentration than that of CO_2 .
 5. NADP is reduced when pyruvate is formed in bundle sheath cells.

- 11) Which of the following event did **not** occur in Paleozoic era?
1. Domination of Amphibians.
 2. Domination of gymnosperms which bear corns.
 3. Extensive forest of vascular plants.
 4. Origin and radiation of reptiles.
 5. Appearance of seeded plants.
- 12) Which of the following statement regarding Domain Bacteria is correct?
1. It consists same members who are multicellular in nature.
 2. Normally the size of the cells are greater than $50\mu m$.
 3. The peptidoglycan's amount in Gram (+) ve bacteria's cell wall is greater than that of in gram (-) ve bacteria.
 4. Capsule presents in all the members of bacteria.
 5. Only the free-living cyanobacteria show Nitrogen (N_2) fixing ability.
- 13) Which one of the following statements is **incorrect** regarding Protists and their corresponding habitats?
1. *Amoeba* - Freshwater, Marine water.
 2. *Euglena* – All are in fresh water.
 3. Diatom - Fresh water, Marine water.
 4. *Gelidium* – Marine water.
 5. *Sargassum* – Marine water.
- 14) Which of the following statements regarding the members of kingdom fungi is correct?
1. All are absorptive saprophytic heterotrophs.
 2. The zoospores in phylum chytridiomycota are formed by mitosis during asexual reproduction.
 3. All zygospores in phylum zygomycota are equal in genotype as they are formed by mitosis.
 4. All members of phylum Ascomycota are aquatic dwells.
 5. All members of phylum Basidiomycota reproduce by sexual reproduction.
- 15) Which of the following statements regarding Phylum Pterophyta are **incorrect**?
- a) Sporophytes are dominant.
 - b) The fronds found in the apex of aerial shoot.
 - c) Some members show heterospory in nature.
 - d) All gametophytes are monoecious.
1. a, b 2. a, c 3. b, c 4. a, d 5. b, d
- 16) Which of the following statements regarding the members of phylum Platyhelminthes is correct?
1. A pair of eyespots are found in the head region of liver fluke.
 2. Each of the proglottids in the tape worm are hermaphroditic in nature.
 3. In some members, the alimentary canal contains mouth and anus.
 4. Multi cellular Flame bulbs form the simple excretory structure.
 5. Cross fertilization occurs in tape worms.
- 17) Which of the following statements regarding Osteichthyes is **incorrect**?
1. Vertebral column continues into caudal fin.
 2. Ctenoid and Cycloid scales are found.
 3. The larva develops in external water medium.
 4. They show external fertilization.
 5. Nictitating membranes do not found in eyes.

18) Which of the following is **not** a derivative of dermal tissue?

1. Epidermis
2. Guard cells
3. Spongy parenchyma tissue
4. Trichome
5. Root hair

19) Which of the following statement is correct regarding primary structure of monocot stem?

1. The vascular bundles are arranged radially.
2. The parenchyma tissue of bundle sheath surrounds the vascular bundle.
3. The ground meristem forms cortex and pith.
4. Normally, the phloem parenchyma tissue does not found in the primary phloem tissue.
5. The primary xylem and meta- xylem are found as a linear line in vascular bundle.

20) Which of the following comparisons between monocot and dicot plant leaves is **incorrect**?

Dicot leaves

Monocot leaves.

- | | |
|---|--|
| 1. The mesophyll is differentiated into spongy and palisade parenchyma | The mesophyll is not differentiated into spongy and palisade parenchyma. |
| 2. Stomata are distributed as evenly in the lower and upper epidermis. | Stomata are mostly dispersed in the upper epidermis. |
| 3. The collenchyma tissue will commonly found between the upper and lower epidermis interiorly. | The collenchyma tissue does not found in mesophyll. |
| 4. Vascular bundles are supported by | Vascular bundles are supported by sclerenchyma tissue. |
| 5. The fibrous tissue found interiorly to the bundle sheath in a vascular bundle. | Fibrous tissue found interiorly to the bundle sheath in a vascular bundle. |

21) Which of the following statement is correct regarding the radial transport occur in plants.

1. Apoplast route found as continuously to the pericycle.
2. The symplast route is not as continuously from the epidermis to xylem vessel.
3. By releasing solutes from Endodermis and the living cells of vascular tissue to their cell wall they contribute to the apoplast transport.
4. Some substances are transported into the xylem tissue from endodermis toy trans membrane route.
5. Some substances are lost to soil solution from xylem sap.

22) Which of the following statements about transpiration in plants is **incorrect**?

1. It helps plants to absorb mineral ions from soil solution.
2. The water potential of water vapour in sub – stomatal cavity is higher than that of atmosphere during the day time.
3. The wind velocity increases the rate of transpiration by removing diffusion shell water vapour from the leaves.
4. The rate of transpiration decreases when the available soil water decreases.
5. The stomatal transpiration percentage is between 50 – 60% of the total transpiration.

23) Which of the following elements is **not** absorbed in more than one forms?

1. B 2. N 3. Cu 4. P 5. Fe

24) Which of the following statements about the gametophyte in terrestrial plants is correct?

1. The gametophytes are dominant in all vascular plants.
2. The gametophytes are dominant in all non-vascular plants.
3. The free living gametophytes found only in non-vascular plants.
4. The epigeal gametophyte in spike mosses, are nourished by the mutualistic mycelium.
5. Many female gametophytes found in a single mega sporangium in *Cycas*.

25) Which of the following statements is **incorrect** regarding the microspores formed in flowering plants?

1. They have the similar structure as like with *Cycas* pollen grains.
2. They form single celled male gametophytes after germination.
3. Microspores dispersed by wind or water or animals.
4. The male nuclei found in the micro spore formed by mitosis.
5. The micro spores in monocot plants consist one pore or furrow.

❖ Follow the following summarized instructions for answering the questions from 26 – 30.

A, B, D correct	A, C, D correct	A, B correct	C, D correct	For other combinations
1 st Answer	2 nd Answer	3 rd Answer	4 th Answer	5 th Answer

26) Which of the following structure / structures found in Eukaryotic cells belong to extracellular components?

- (A) Cell wall
- (B) Plasmodesmata
- (C) Collagen in animal cells.
- (D) Tight junctions.
- (E) Plasma membrane.

27) Which of the following feature / features found in both Annelida and Arthropoda?

- (A) Well developed
- (B) External fertilization
- (C) Gills
- (D) Segmentation
- (E) Ciliated larva

28) Which of the following feature / features is/are common to both *Gelidium* and Diatom?

- (A) Marine habitat
- (B) Cell wall made up of cellulose and pectin.
- (C) Multicellular vegetative body.
- (D) Storage component.
- (E) Reproductive cells having locomotive structure.



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Index No :

- This question paper consists of 07 questions in 10 papers.
- This question paper comprises part A and part B.

Part- A Structured essay (pages2-9).

- ❖ Answer all four questions on this paper itself.

Write your answer 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 10).

- ❖ 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 the top of Part B before handing over to the invigilator.
- ❖ You are permitted to remove only Part B of the question paper from the examination hall.

For Examiner's use only

Part	Question No	Marks
A	01	
	02	
	03	
	04	
B	05	
	06	
	07	
Total		
Percentage		

Final Marks

In Numbers	
In words	

Examiner	
Checked by	1
	2
Supervised by	

Part II

A - Structured Essay Questions.

☞ **Answer All questions.**

01. A. i. Write briefly what is photosynthesis?

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ii. What do you understand from absorption spectra of photosynthesis?

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iii. Give four main processes occur in light reaction of photosynthesis?

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iv. Mention the particular site in chloroplast in which the light reaction takes places.

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v. a) Mention the two environmental factors which cause photo respiration in C₃ plants and Mention how they cause photo respiration?

Environmental

Method of causing photo respiration

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b) Mention the two internal factors which cause photo respiration in C₃ plants and Mention how they cause photo respiration?

Internal factors

Method of causing photo respiration

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.....

B. i. What do you understand by enzyme active site?

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ii. How the enzyme substrate complex is formed?

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iii. Draw a graph in the following space to show how the enzyme rate of reaction is affected by temperature?

iv. What do you understand by optimum temperature in enzyme function?

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v. Why the enzyme rate of reaction is high in optimum temperature?

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C. i. What do you understand by the term Allosteric enzyme?

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ii. What is considered as oscillation of Allosteric enzyme?

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iii. What is Allosteric site?

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iv. Where the Allosteric site found normally in an enzyme?

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v. What is called competitive inhibitor of an enzyme?

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vi. How competitive inhibitor differs from Allosteric regulator?

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.....

vii. Give example for Reversible and Irreversible Inhibitor?



Example

Reversible Inhibitor

Irreversible Inhibitor

02. A. i. What do you understand by the term resolution power of light microscope?

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ii. What is the relationship between the wave length used and the resolution power of light microscope.

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iii. What is the highest magnification could be obtained in light microscope as theoretically?

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iv. Mention as steps how you will use a light microscope to observe a given monocot stem containing permanent slide in laboratory?

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v. Draw and label the appearance of the above permanent slide specimen in the following space?

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B. i. Mention the main concepts included in the cell Theory?

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ii. Name three scientist which contributed to the cell theory?

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iii. Give four basic features that shared by both prokaryotic and eukaryotic cells?

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iv. Give four Different features that found in Eukaryotic and prokaryotic cells. (use sixe, cell no, Hereditary material and cell wall component)

Prokaryota

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Eukaryota

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v. Give four differences between the two domain members of prokaryotes.

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C. i. What do you understand by the term cell cycle?

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ii. What are the two phases found in Eukaryotic cell cycle?

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iii. Mention four factors that determine duration of the cell cycle?

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iv. Mention the two physical factors that control the division?

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.....

v. Give two factors that promote the proliferation of cancer cells?

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.....

vi. a) What is the chemical factor that induce to form cell mass in plant tissues?

.....

b) Name an Eukaryotic organism which induce the Gall formation in plant?

.....

03. A. i. Mention the time period of the proto cell evolved on Earth surface? (in million years)

.....

ii. Give four factors which were essential to synthesize the organic molecule found in the proto cell?

.....

.....

iii. Give three life features of proto-cell?

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iv. How the proto-cell increased in its size?

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.....

v. Mention the age of first photosynthetic organism?

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vi. What are the two main effects caused on earth surface by the formation of first photosynthetic organism?

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B. i. What do you understand by the term alternation of generation in plants' life cycle?

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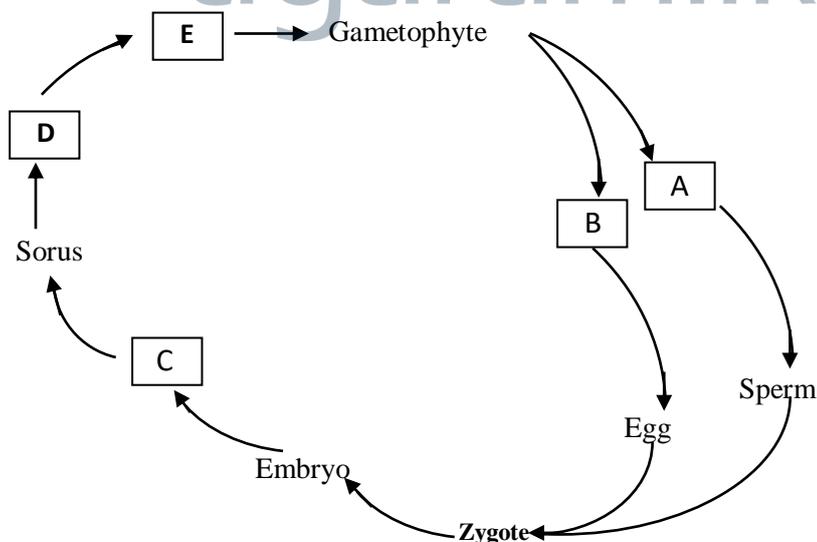
ii. Give four evolutionally features found in green plants which do not found in chlorophytes, from which the green plants evolved?

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iii. Name two phyla included under non-seeded vascular plants?

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.....

iv.



Name the generic name of a terrestrial plant which shows above life cycle.

.....

v. Label the components from A – E included in the above life cycle.

- A B
C D
E

vi. Give three specific features found in the Dominant Generative organism, which you have mentioned in question (iv) above.

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.....

C. i. Name three animal phyla were included under protostome group?

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.....

ii. Use the **letter/letters** depicted against the animals below to answer the following some features found in the Kingdom Animalia.

- A. *Hydra*
B. Hook worm
C. Earth worm
D. Cuttlefish
E. Centipede
F. Star fish



Features

1. Radial symmetry. :-
2. Distinct cephalization. :-
3. Well-developed coelom. :-
4. Endoskeleton. :-
5. Hermaphroditism. :-
6. Marine dwelling. :-
7. Segmented body structure. :-
8. Internal fertilization. :-
9. Photo receptor containing eye :-
10. Solid Nerve Cord :-

04. A. i. Name three main plant tissue systems

.....

ii. Name the derivate tissues from those main tissue systems.

Main tissue

Derived Portion / Portions

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.....
.....

iii. State three differences seen in the meristamatic regions of stem and root apices.

Stem apices

Root apices

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.....
.....

iv. a) What is the theory which is used to explain the mechanism of upward conduction of water in trees?

.....

b) What is the hypothesis that is used to explain the mechanism of conduction in solutes in phloem?

.....

v. Name the cells in the correct sequence through which a carbon atom from a molecule of CO₂ found in atmosphere pass until it gets stored in starch in a root of C₄ photosynthetic plant?

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.....

B. i. Give three adaptive features found in terrestrial plants' leaves to capture maximum amount of sunlight.

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ii. What do you understand by "Guard" cells?

.....
.....

iii. Give three physiological adaptations found in typical dicot leaves to increase the photosynthetic efficiency.

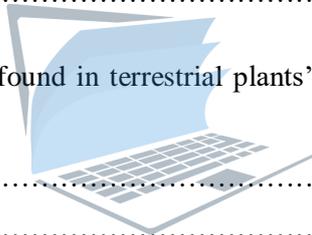
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iv. Briefly explain the stomatal opening mechanism by using K⁺ influx hypothesis.

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v. Mention four factors that affect the function of stomata?

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C. i. Name the components of phloem tissue that found in Anthophytes.

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ii. Name the component that adapted to translocate in the above phloem tissue.

.....

iii. Give four adaptations found in that component to translocate.

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.....

iv. Give four specific features of phloem translocation.

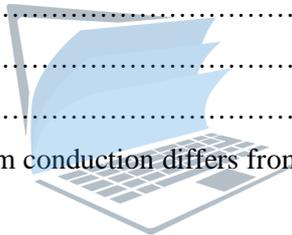
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v. How the mechanism of phloem conduction differs from xylem conduction?

Xylem Conduction

Phloem Conduction

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Part II

B - Essay Questions

☞ Answer only two questions.

05. a) What do you understand by cellular respiration?
b) Describe the aerobic respiration process by mentioning the changes that occur in each stages.
06. a) Describe briefly the primary structure of typical dicotyledonous root and mention the functions of different tissues found.
b) Describe the secondary growth process in the typical dicotyledonous stem.
07. Write short notes for the followings:
a) Characteristic features of non – vascular plants.
b) Apoplastic route.
c) The statolith hypothesis and geotropic movement of root.