# First Term Examination - 2022

## Conducted by

## Field Work Centre, Thondaimanaru.

FWC

**Biology - I**

Three Hours

Three hours and ten min.

**Gr -12 (2023)**

- Answer **all** questions.
- In each of the question 1-25, 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 using blue or black pen.

1) Which of the following can be an adaptation?
   *(1)* Control the chemical processes.
   *(2)* Sunken stomata in xerophytic plants.
   *(3)* Continuous existence of species.
   *(4)* Genetic variations in organisms.
   *(5)* Lower-level components are organized in a methodical pattern.

2) Major property of water that helps in transporting water and dissolved minerals through the xylem.
   (1) High specific heat (2) Adhesion (3) Polarity
   (4) Cohesion (5) High surface tension

3) Which one of the following statements is correct regarding carbohydrates?
   (1) Galactose and fructose are aldose type of monosaccharides.
   (2) All the carbohydrates are macro molecules.
   (3) They have O:H ratio at 2:1.
   (4) General formula of them is $(CH_2O)$ n.
   (5) Hereditary materials of organisms contain carbohydrates.

4) Correct statement regarding lipids.
   (1) They are made up of three glycerols and fatty acids.
   (2) Hydro carbon chains of fatty acids contribute to the hydrophilic nature of the fats.
   (3) Unsaturated fats contain double bonds in their hydro carbon chain of fatty acids.
   (4) Only consuming excess saturated fatty acids contribute to atherosclerosis.
   (5) They contain phosphodiester bonds.

5) Quaternary structure of protein,
   (1) contains only inter molecular bonds.
   (2) is involved in the formation a polypeptide chain.
   (3) is not affected by denaturation.
   (4) contains α and β sub units.
   (5) involves in the transportation of fatty acids.

6) Which one of the following statements regarding nucleic acids is correct?
   (1) Nucleic acids consist of elements such as C, H, O, N and P.
   (2) They are polymers of nucleosides.
   (3) Some nucleic acids are branched.
   (4) All the nuclei acids contain nitrogenous bases A, T, C and G.
   (5) All the nuclei acids store genetic information in organisms.

7) a. 70 s ribosome b. Circular DNA
c. Ability to fix nitrogen d. Peptidoglycan
e. Histone protein.
Which of the above found only in prokaryotes.
(1) a and e (2) c and d (3) b and d
(4) a and b (5) a, b, c and d

8) Correct regarding the prominent organelle - nucleus.
(1) Nuclear matrix is made up of glycoprotein filaments and extended throughout the interior of the nucleus.
(2) In non-dividing cells, chromosomes appear within it.
(3) Synthesis of RNA occurs within it.
(4) Nucleolus appears with adjoining part of the chromatin and membrane bounded.
(5) It has an average diameter of 10µm.

9) Produce transport vesicles, exocytosis, participates in photorespiration, Osmotic balance.
Organelles regarding the above given functions respectively.
(1) Smooth endoplasmic reticulum, glyoxisome, peroxisome, central vacuole.
(2) Golgi apparatus, lysosome, peroxisome, central vacuole.
(3) Endoplasmic reticulum, Golgi apparatus, peroxisome, contractile vacuole.
(4) Rough endoplasmic reticulum, lysosome, mitochondria, central vacuole.
(5) Rough endoplasmic reticulum, Golgi apparatus, peroxisome, lysosome.

10) Correct regarding cell junction, location and function.
(1) Tight junction, skin epithelium, exchange of signals.
(2) Anchor junction, muscle tissue, prevent leakage of extra cellular fluids.
(3) Communication junction, animal embryo, exchange of materials.
(4) Desmosome, heart muscle, attach of adjoining cells.
(5) Gap junction, muscle tissue, transport of amino acids.

11)
**a.** Formation of mitotic spindle.
**b.** Microtubules attached to kinetochore get shorten.
**c.** Chromosomes unwind and become less condense to form chromatin.
**d.** DNA wind around histone beads and form chromatin.
**e.** Each chromosome of the cell gets attached to the kinetochore microtubule.

Correct sequential order of the phases of eukaryotic cell cycle given above.
(1) d, b, a, c, e
(2) d, a, e, b, c
(3) a, b, d, c, e
(4) a, d, e, b, c
(5) d, a, b, e, c

12) An event that occurs in mitosis and meiosis II, but does not occur in meiosis I.
(1) Formation of synaptonemal complex.
(2) Separation of homologous chromosomes.
(3) Centrosomes begin to form the mitotic spindle.
(4) Visibility of chiasmata.
(5) Separation of chromatids.

13) Significance of meiosis.
(1) Maintain the genetic stability.
(2) Maintains the constant number of chromosomes through generations.
(3) Participates in asexual reproduction.
(4) Regeneration of cells.
(5) Growth and development.

14) ATP
(1) forms from an exergonic reaction which yields energy.
(2) utilizes 30.5 $kJmol^{-1}$when hydrolyses.
(3) forms within cells by phosphorylation.
(4) is immobile.
(5) synthesis occurs in the Calvin cycle with the aid of sunlight.

15) Correct statement regarding enzymes.
(1) They are chemical catalysts.
(2) The shape of the active site of an enzyme is always fully complementary to its substrates.
(3) All organisms have optimum temperature around the body temperature.
(4) The alteration of pH above or below the optimum temperature led to decline in enzyme activity, due to the alteration of chemical bonds involving in formation of enzyme substrate complex.
(5) When the temperature increases beyond the optimum temperature, the collision of enzyme and substrate molecules increases and leads to increase in enzyme activity.

16) In the light reactions of photosynthesis,
(1) photo respiration occurs.
(2) participating each photosystems contains a primary electron acceptor.
(3) only non-cyclic phosphorylation takes place.
(4) reduction of NADH takes place.
(5) PEP carboxylase participates.

17) Correct regarding the following combinations.
(1) Glycolysis – release of two molecules of $CO_2$.
(2) Oxidative phosphorylation – oxidation of NADPH.
(3) Krebs cycle – generation of $FADH_2$.
(4) Oxidation of pyruvate - ATP synthesis.
(5) Oxidative phosphorylation – final electron acceptor is organic compound.

18) Some statements regarding biochemical evolution, origin of proto cells are given below:
**P.** A source of organic molecules may have been meteorites.
**Q.** Organic molecules including RNA which was found in primitive soup accumulated in to a lipid bound vesicles.
**R.** Abiotic synthesis of small organic molecules favors the inheritance of proto cell.
Which of the above is/are correct?
(1) P and R (2) P and Q (3) P only
(4) R only (5) P, Q and R

19) Common to *Euglena*, *Amoeba* and *Paramecium* which inhabit in fresh water.
(1) Eye spot (2) Pellicle (3) Heterotroph
(4) Flagellum (5) Contractile vacuole


Agaram.LK - keep your dreams alive!

20) Which one of the following statements is most important in explaining the Darwin-Wallace theory?
(1) The parts of the body that are used extensively become larger and stronger.
(2) Organisms acquired adaptations during their life time.
(3) Favorable characteristics in a population leads to genetic variation.
(4) The population of a species vary in characteristics among their inheritance traits.
(5) The part of the body, which is not used, deteriorates.

➢ **Use the following instructions for the questions 21– 25.**

| A B D correct | A C D correct | A B correct | C D correct | Any other response |
|---|---|---|---|---|
| **1st Answer** | **2nd Answer** | **3rd Answer** | **4th Answer** | **5th Answer** |

21) Function / functions of monosaccharides.
A. Component of nucleotide.
B. Storage.
C. Building blocks of poly saccharides.
D. Energy source.
E. Translocation in phloem.

22) Cytoskeleton
A. contains keratin protein subunits.
B. maintains the cell shape in animal cells.
C. contains microtubules which are made up of actin filaments.
D. involves in the cytoplasmic streaming.
E. involve in the formation of cilia and flagella.

23) Correct comparison / comparisons between C3 plants and C4 plants.

| Character | C3 Plant | C4 Plant |
|---|---|---|
| A. $CO_2$ fixing enzyme | RuBISCO | PEP – carboxylase |
| B. First stable product in $CO_2$ fixation | 3 C carbohydrate | 4 C carbohydrate |
| C. Leaf anatomy | Bundle sheath cells are not green | Bundle sheath cells are green |
| D. Photosynthesis | In mesophyll cells | Both in mesophyll cells and bundle sheath cells. |
| E. Productivity | Yield is usually higher | Yield is usually lower |

24) Released in glycolysis.
A. Two NADH molecules.
B. Two $CO_2$ molecules.
C. Two pyruvate molecules.
D. Two acetaldehyde molecules.
E. Two ATP molecules.

25) Correct comparison / comparisons regarding structures of Protists – example.
A. Food vacuole - *Paramecium.*
B. Multicellular thallus – *Ulva.*
C. Pellicle - *Amoeba.*
D. Holdfast – *Euglena.*
E. Macronucleus and micronucleus – Diatom.

FWC

# First Term Examination - 2022

## Conducted by

## Field Work Centre, Thondaimanaru

| Biology - II | Gr -12 (2023) | 09 | E | II |
|---|---|---|---|---|

**Index No: ……**

**Instructions**:

- This question paper consists of **06** questions in **09** pages.
- This question paper comprises Part **A** and **B**. The time allotted for **both parts (I and II)** is **three hours**. (Additional reading time is **10 minutes**)
- Use additional reading time to go through the question paper, select the questions and decide on the questions that you give priority in answering.

**Part A – Structured essay (Pages 02 – 08)**

- 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 09)**

- Answer **two** questions only. Use the separate papers 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 examiner's use only

| Part | Question No. | Marks |
|---|---|---|
| A | 01 | |
| | 02 | |
| | 03 | |
| B | 04 | |
| | 05 | |
| | 06 | |
| Total | | |

| | |
|---|---|
| In numbers | |
| In words | |

| | |
|---|---|
| Examiner 1 | |
| Examiner 2 | |
| Checked by | |
| Supervised by | |

## A – Structured Essay

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

**(Each question carries 100 marks)**

01) A) i. a) What are natural resources?

……

b) What are the environmental problems arising due to over exploitation of natural resources?

……..

……

……

ii. a) Give **two** examples for non-communicable diseases.

……

b) Give **two** examples for communicable diseases.

……

c) What is the causative factor for Covid-19?

……

iii. Fill the following blank with a suitable word.

"Due to **……..,** one of the characteristics of organisms, lower-level components are organized in a methodical pattern in upper level to make it most efficient"

iv. Briefly explain the followings.

a. Metabolism

……

……..

b. Reproduction

……

……..

v. What is the function of genes?

……

……

B) i. Water is a vital inorganic molecule. How polarity originates in a water molecule?

……..

ii. a. Which trait of water will function as thermal buffer?

……

b. What is the reason of water that contain high surface tension?

……

c. What is the significance of transpiration in plants?

……

iii. What is the ability is given to water act as versatile solvent?

……..

iv. a) Give **two** important characters found in all monosaccharides.

……

……

b) Indicate the major types of monosaccharides regarding to their carbonyl group and give an example for each type.

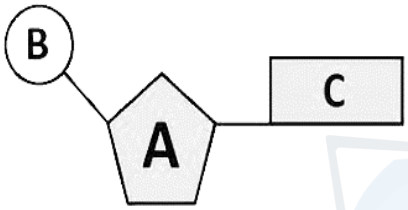
…… ……...

…… ……...

v. Indicate the monomeric unit of the hemicellulose and give **one** its function.

…… ……

C) i. Structure of a nucleotide is given below.




a) Name the component A.

……

b) There are two types found in nucleic acids regarding to A. What is the important difference between them?

……

c) 1. Which component gives acidity to the nucleic acids?

……

2. Indicate a **nucleoside** in the diagram by drawing a circle around it.

ii. What is antiparallel arrangement of DNA?

……

iii. Indicate the base pair rule.

……

iv. a. Name the nitrogenous bases that found in RNA.

……..

b. Indicate the **three** types of RNA and give a function for each.

| **Type of RNA** | **Function** |
|---|---|
| …… | …….. |
| …… | …….. |
| …… | …….. |

v. Indicate an organelle that contains circular DNA.

……

2) A. i.

a. Give **three** global importance of photosynthesis.

……

……

……

b. Which visible lights are absorbed by chlorophylls?

……

ii. What is meant by absorption spectrum?

……

……

iii. a. What are photo systems?

……

……

b. What are the **two** complexes found in photo systems?

……

……

iv. a. In which photo system / systems the splitting of water takes place?

……

b. What is the significance of splitting of water in the photo system/s you mentioned above?

……

d) Indicate a molecule that forms during some photoexcited electrons from photo system I uses an alternative cyclic path way.

……

v. Give **three** significances of $C_4$ path way over to $C_3$ path way.

……

……

……

B. i. a. Indicate the cell theory.

……

……

……

b. What is the feature that the Theodore Schwann mentioned regarding cell theory?

……

ii. Which provide the fluid nature to the plasma membrane?

……

iii. Which characteristic found in the plasma membrane for the following functions?

a. Exchange of materials.

……

b. Maintain the cell shape.

……

iv. Give **one** organelle for the following each function.

a. Storage and transmission of genetic information ……..

b. Produces transport vesicles ……

c. Transport residue materials out of cell by exocytosis. ……..

v. Give the functions of extra cellular matrix.

……

……

C. i Give **two** characteristics of lipids.

……

……

ii. Draw a diagram to show the formation of a fat in the space given below.

iii. a. Indicate the constitutes of a phospholipid molecule.

……

b Give an example for a lipid which act as a signaling molecule that travel through the body.

……

iv. Indicate that the following each protein can be included in which structural type of protein.

a. Silk fiber ……

b. Collagen ……

v. Briefly explain how the test for protein can be done in the laboratory.

……

……

……

3) A. i.

a. Indicate the **two** major phases of eucaryotic cell cycle.

……

……

b. Name the phase for the following each event.

1) Synthesis of proteins essential for S phase.

……

2) Synthesis of proteins essential for mitotic phase

……

ii. Give **two** significances of mitosis.

……

……

iii. Place a tick (✓) weather the following statement regarding meiosis is correct and a cross (**X**) weather the following statement regarding meiosis is incorrect.

**a.** Meiosis I is a reduction division. ( )

**b.** Synaptonemal complex is formed in prophase II. ( )

**c.** Two genetically unidentical daughter cells formed in telophase I ( )

**d.** Replication of DNA does not take place between meiosis I and II. ( )

iv. a. Give **three** characters of cancer cells.

……

……

……

b. What is metastasis?

……

……

c. In which path a few tumor cells may separate from the original tumor and travel to other parts of the body?

……

v. a. What are galls in plants?

……

……

b. Give **two** factors that causes the galls on plants.

……

……

B) i. a. What is classification?

……

……

b. Name the **two** types of classification.

……

……

c. i) What is the basic difference found in the two types you mentioned above in i). b?

……..

ii. a. Who scientifically classified the organisms first?

……..

b. Which hierarchical orders were used by Carolus Linnaeus to classify plants?

……..

iii. What are the important taxonomic criteria used in the present system of classification?

……..

……..

……..

iv. a. Indicate the hierarchical orders of classification regarding increasing number of common characters.

……..

……

b. Give the biological definition of species.

……..

……..

……..

v. a. Fill the blanks in the following statement with **suitable terms.**

"In binomial nomenclature each species poses a generic name which is usually a **……** and specific epithet is an**……..** describing a particular feature."

b. Write the **species name** of Sri Lankan leopard using international codes of Binomial nomenclature.

……

C. ***Salmonella, Anabaena, Paramecium*, Diatom, *Thermococcus, Ulva*.**

Write the names from the given organisms above, for the following statements.

***(*Using a name at once*)*.**

a) Organism that contains silica as cell wall component**……**

b) Organism that can fix nitrogen **……**

**c)** Organism that inhabits extreme environments**…….....**

d) Organism that contains both macro and micro nucleus**……**

**e)** Organism that contains chlorophyll a and b pigments **…….....**

f) Organism that contains peptidoglycan as cell wall component **…….....**





Agaram.LK - keep your dreams alive!

FWC

# First Term Examination - 2022
## Conducted by
## Field Work Centre, Thondaimanaru.

**Biology - II**

**Gr -12 (2023)**

**B –Essay**

- **Answer two questions only.**
- **Draw fully labelled diagrams where necessary.**
- **Each question carries 150 marks.**

4. a. Briefly describe the general characteristics of enzymes.

   b. Describe how the inhibitors affect the enzyme reactions.

5. a. Describe the alcohol fermentation and lactic acid fermentation including their major sites, major events and end products.

   b. Briefly describe how lipids and proteins are used in aerobic respiration.

6. Write short notes for the followings:

   a. Cytoskeleton.

   b. Photorespiration.

   c. Lamarck's theory.