Annual Examination, 2020-2021

BIOLOGY

Grade: 11 **Time: 3 Hours**

Date: 14.02.2021 **Max. Marks: 70**

General Instructions:

(i) All questions are compulsory.
(ii) The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.
(iii) Section–A has 14 questions of 1 mark each and 02 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D has 3 questions of 5 marks each.
(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

Section – A

1. Write the correct order sequence of taxonomical categories? [1]

2. Define metabolism. [1]

3. Name seedless vascular plants. [1]

4. Why are corals important? [1]

5. What is the Law of Limiting factor? [1]

6. Provide appropriate technical term in the space provided. [1]
   a. Blood-filled cavity in arthropods _____
   b. Free-floating form of cnidaria _____

7. Distinguish between Diabetes mellitus and Diabetes insipidus? [1]

8. How are prosthetic groups different from co-factors? [1]

9. Where dose mitosis takes place in plants and animals? [1]

10. What are the two names for Krebs cycle? [1]

11. **Assertion:** The growth in living organisms is from inside. [1]

Reason: Plants grow only up to certain age

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion
c. If the assertion is true but the reason is false
d. If both the assertion and reason are false

(OR)

Assertion: Cell secretion does not occur in bacteria.
Reason: Golgi complex is absent in bacteria.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion
c. If the assertion is true but the reason is false
d. If both the assertion and reason are false

12. **Assertion:** In Funaria, the young stem is photosynthetic. [1]
Reason: It contain hydroids.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion
c. If the assertion is true but the reason is false
d. If both the assertion and reason are false

13. **Assertion:** Power house of cell is mitochondria. [1]
Reason: ATP is produced in mitochondria.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion
c. If the assertion is true but the reason is false
d. If both the assertion and reason are false

14. **Assertion:** Photosynthetically C4 plants are less efficient than C3 plants. [1]
Reason: The operation of C4 pathway requires the involvement of only bundle-sheath cells

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion
c. If the assertion is true but the reason is false
d. If both the assertion and reason are false

15. ***Read the following and answer any four questions from 15(i) to 15(v) given below:*** [4]
Since the dawn of civilisation, there have been many attempts to classify living organisms. In Linnaeus' time a Two Kingdom system of classification with Plantae and Animalia kingdoms was developed. This system did not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and photosynthetic (green algae) and non-photosynthetic (fungi) organisms. A need was also felt for including, besides gross morphology, other characteristics like cell structure, nature of wall, mode of nutrition, habitat, methods of reproduction, evolutionary relationships, etc. Classification systems for the living organisms have hence, undergone several changes over time. R.H. Whittaker (1969) proposed a Five Kingdom Classification. The kingdoms defined by him were named Monera, Protista, Fungi, Plantae and Animalia. The main criteria for classification used by him include cell structure, thallus organisation, mode of nutrition, reproduction and phylogenetic relationships.

i. The two kingdom Classification was given by:
(a) Linnaeus
(b) John ray
(c) Huxley
(d) Whittaker
ii. According to five-kingdom classification, which of the following does not contain nuclear membrane?
(a) Protista
(b) Monera
(c) Fungi
(d) Animalia
iii. Which of the following statements is false about the fungi?
(a) They are eukaryotes
(b) They are heterotrophs
(c) They possess a purely cellulosic cell wall
(d) None of the above

iv. Phylogenetic classification is based on _____:
(a) Overall similarities
(b) Habit of plants
(c) Common evolutionary descendants
(d) All of these

v. **Assertion :** Classification is necessary to study all living organisms.
Reason : In classification, individuals are grouped into categories.
(a) If both the assertion and the reason are true and the reason is a correct explanation of the assertion
(b) If both the assertion and reason are true but the reason is not a correct explanation of the assertion
(c) If the assertion is true but the reason is false
(d) If both the assertion and reason are false

16. ***Read the following and answer any four questions from 16(i) to 16(v) given below:*** [4]

The sequence of events by which a cell duplicates its genome, synthesizes other cell contents and eventually divides into two daughter cells is termed as cell cycle.

Cell cycle, the ordered sequence of events that occur in a cell in preparation for cell division. The cell cycle is a four-stage process in which the cell increases in size (gap 1, or G1, stage), copies its DNA (synthesis, or S, stage), prepares to divide (gap 2, or G2, stage), and divides (mitosis, or M, stage). The stages G1, S, and G2 make up interphase, which accounts for the span between cell divisions. On the basis of the stimulatory and inhibitory messages a cell receives, it “decides” whether it should enter the cell cycle and divide.

Cells use special proteins and checkpoint signaling systems to ensure that the cell cycle progresses properly. Checkpoints at the end of G1 and at the beginning of G2 are designed to assess DNA for damage before and after S phase. Likewise, a checkpoint during mitosis ensures that the cell’s spindle fibres are properly aligned in metaphase before the chromosomes are separated in anaphase. If DNA damage or abnormalities in spindle formation are detected at these checkpoints, the cell is forced to undergo programmed cell death, or apoptosis. However, the cell cycle and its checkpoint systems can be sabotaged by defective proteins or genes that cause malignant transformation of the cell, which can lead to cancer. For example, mutations in a protein called p53, which normally detects abnormalities in DNA at the G1

checkpoint, can enable cancer-causing mutations to bypass this checkpoint and allow the cell to escape apoptosis.

i. Which of the following organism would you NOT expect to use the cell cycle described here?
(a) A daisy
(b) A kitten
(c) An archaebacteria
(d) None of the above.

ii. Which of the following is NOT a reason why interphase is necessary?
(a) Daughter cells begin life with only one copy of their DNA.
(b) Daughter cells begin life small, without sufficient cellular machinery to pass on to daughter cells.
(c) If cells performed mitosis repeatedly without going through interphase, each generation of daughter cells would be progressively smaller.
(d) All of the above.

iii. Which of the following is true of the G2 phase?
(a) It is when the cell's DNA is copied.
(b) It is the first phase of the cell cycle after mitosis.
(c) It contains the important G_2/M checkpoint which checks the cell for DNA damage before allowing it to reproduce.
(d) None of the above.

iv. Which of the following cell cycle descriptions is CORRECT?
(a) Chromosomes are replicated during the G1 phase.
(b) Interphase is when the cell spends most of its time performing its cell functions.
(c) The S phase consists of prophase, metaphase, anaphase, and telophase.
(d) Mitosis is the longest phase of the cell cycle.

v. **Assertion :** Meiotic division results in the production of four dissimilar cells.
Reason : Synapses occurs during zygotene of meiosis.
(a) If both the assertion and the reason are true and the reason is a correct explanation of the assertion
(b) If both the assertion and reason are true but the reason is not a correct explanation of the assertion
(c) If the assertion is true but the reason is false
(d) If both the assertion and reason are false

Section – B

17. If a tissue has at a given time 1024 cells, how many cycles of mitosis had the original parental single cell undergone? [2]

18. Draw a neat and well labeled diagram of Nerve cell? [2]

19. Differentiate between Gram Positive and Gram Negative bacteria? [2]

20. What is the difference between cutaneous and pulmonary respiration? [2]

(OR)

The following abbreviations are used in the context of excretory functions, what do they stand for?
a. ANF
b. ADH
c. GFR
d. DCT

21. Mention two modifications in reptiles required for terrestrial mode of life. [2]

22. State two functions of accessory pigments found in thylakoids? [2]

23. Polluted water bodies have usually very high abundance of plants like Nostoc and Oscillitoria. Give reasons [2]

24. What do grey and white matter in the brain represent? [2]

(OR)

Why closed circulatory system is considered advantageous?

25. What are gonadotropins? [2]

SECTION – C

26. Differentiate between Right ventricle and Left ventricle? . [3]

27. Write floral formula for a flower which, is bisexual; actinomorphic; sepals five, twisted aestivation, petals five; valvate aestivation; stamens six; ovary tricarpellary, syncarpous, superior, trilocular with axile placentation [3]

28. Why are C4 plants preferred in the tropical region? [3]

(OR)

Describe the structure and function of ATP?.

29. Different substrates get oxidized during respiration. How does Respiratory Quotient (RQ) indicate which type of substrate, i.e., carbohydrate, fat or protein is getting oxidized? [3]

$$\text{R.Q.} = \frac{A}{B}$$

What do A and B stand for?

What type of substrates have RQ of 1, <1 or >1?

(OR)

RuBP carboxylase, PEPcase, Pyruvate dehydrogenase, ATPase, cytochrome oxidase, Hexokinase, Lactate dehydrogenase.
Select/choose enzymes from the list above which are involved in
a. Photosynthesis
b. Respiration
c. Both in photosynthesis and respiration

30. Write down the common features of the connective tissue. [3]

SECTION-D

31. Describe the structure of typical eukaryotic chloroplast. [5]

(OR)

Draw a comparison between C3 and C4 plants.

32. Draw a labelled diagram to show the structural view of Human ear in the sectional view? [5]

(OR)

Describe in brief the respiratory organs of man?

33. What are different classes of enzymes? Explain any two with the type of reaction they catalyse. [5]

(OR)

Write the functions of the following:
a. Centromere
b. Cell wall
c. Smooth ER
d. Golgi Apparatus
e. Centrioles