PREBOARD EXAMINATION – 2020-21

Class: XI (CBSE) **Total Marks: 80**

Date……. **SUBJECT - BIOLOGY** **Time: 3 hrs.**

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 of 4 marks each. 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. How do you testify that cofactors play a vital role in enzyme functioning? 1

2. Where is notochord found in urochordates? 1

3. Give one reasons for each of the following: 1
   a. Photosynthesis is considered to be the most important metabolic process on the earth
   b. Photorespiration is considered to be a wasteful process.

4. Name the kingdoms which include prokaryotic organisms in the three-domain classification. 1

5. Why are mitochondria called 'semi-autonomous' organelles? 1

6. Why were bacteria, cyanobacteria and fungi included in plant kingdom, in the earlier classification systems? 1

7. Nucleotides are phosphorylated nucleosides. Justify. 1

8. **Assertion:** The purpose of making urine is to filter out undigested food from intestine. 1
   Reason: Kidneys filter the waste and produce urine.

   a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
   b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
   c. Assertion is false, but reason is true.
   d. Both assertion and reason are false

9. Mention two functions of the conducting part of the respiratory system. 1

OR

Due to developmental abnormality, the wall of the left ventricle of an infant's heart is as thin as that of right ventricle. What would be its specific effect in circulation of blood?

10. A cell has 32 chromosomes. It undergoes mitotic division. What will be the chromosome number (N) during metaphase? What would be the DNA content (C) during anaphase? 1

11. Name the band of nerve fibres that joins the cerebral hemispheres in mammals. 1

12. Which of them can fix atmospheric nitrogen Mycorrhiza of Pinus or Coralloid roots of Cycas? Why? 1

13. Artificial ripening of fruits is carried out by 1
    a. Auxin
    b. Gibberellin
    c. Abscisic acid
    d. Ethylene

14. Read the following and answer any four questions from 14(i) to 14(v) given below: 4

A naturally occurring class of plant hormone cytokinins has been found to help increase cotton yields during drought conditions according to agricultural research service scientists. Applying cytokinins to cotton seeds for young cotton plants can increase yields 5 to 10% under drought conditions according to new AR S research. Cytokinins promotes cell division and growth in plants, in cotton cytokinins stimulate the growth of the main plant stem and branches. Commercially produced cytokinins are routinely applied in Apple and pistachio orchards to promote fruit growth. ARS cropping system research laboratory in Lubbock TeXas found that applying cytokinins to cotton crops can increase yields in water limited environments with reduced irrigation. Young cotton seedlings have small root system making it difficult for them to reach available soil water. Cytokinins assists the young plants water stress defences prompting the plant to quickly build a bigger root system to access deep soil moisture. They also stimulate the growth of a protective wax on the surface of the plant that helps to reduce water loss.

Burke was granted a patent for his discovery. His tests found that one application of cytokinins produces a 5 to 10% increase in yields underwater reduced conditions. Cytokinins didn't hinder yeilds under fully irrigated or rain condition making it safe to use in all weather and environment. To be effective the cytokinins should be applied at a relatively low concentration to cotton seeds or plants at an early stage of development.

i. What are the different hormones found in plants?

ii. **Assertion:** Auxins are found to help increase cotton yields upto 5-10% under drought conditions
Reason: Relatively low concentration of cytokinins is effective to cotton plants
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true, but reason is false.
d. Both assertion and reason are false

iii. How does cytokinin help the cotton plant to increase yield?

iv. What is the percentage increase in cotton yield after application of hormone?
    a. 10-5%

b. 5-10%
c. Double the percentage of 5-10%
d. 35%

v. When is cytokinins applied to the cotton seeds or plants to get best result?

15. Read the following and answer any four questions from 15(i) to 15(v) given below: 4

Heterotrophic bacteria are the most abundant in nature. The majority are important decomposers. Many of them have a significant impact on human affairs. They are helpful in making curd from milk, production of antibiotics, fixing nitrogen in legume roots, etc. Some are pathogens causing damage to human beings, crops, farm animals and pets. Cholera, typhoid, tetanus, citrus canker are well known diseases caused by different bacteria.

Bacteria grow mainly by fission. Sometimes, under unfavorable conditions, they produce spores. They also reproduce by a sort of sexual reproduction by adopting a primitive type of DNA transfer from one bacterium to the other. The Mycoplasma is organisms that completely lack a cell wall. They are the smallest living cells known and can survive without oxygen. Many mycoplasmas are pathogenic in animals and plants.

i. **Assertion:** Cyanobacteria are photosynthetic autotrophs
Reason: Cyanobacteria have chlorophyll a and b similar to green plants
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true, but reason is false.
d. Both assertion and reason are false

ii. Bacteria grow by
a. Binary fission
b. Fusion
c. Spores
d. Sexual reproduction

iii. **Assertion:** Chemosynthesis is not carried out by autotrophic bacteria
Reason: Chemosynthetic bacteria trap the small amount of energy released from inorganic compounds oxidation to use in the reactions that synthesize carbohydrates
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true, but reason is false.
d. Both assertion and reason are false

iv. How do bacteria reproduce sexually?

v. **Assertion**: Plasmids are double stranded extra chromosomal DNA.
Reason: Plasmids are possessed by eukaryotic cells
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.

b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true, but reason is false.
d. Both assertion and reason are false

16. **Assertion:** The stromal thylakoids are rich in both PSI and PS II. 1
Reason: The granal membranes are rich in ATP synthetase.
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true, but reason is false.
d. Both assertion and reason are false

SECTION-B

17. Write any four characteristics features of Cyclostomes. 2

OR

Where are Bicuspid and Tricuspid valve located in human heart. Name the blood vessels that brings oxygenated blood from lungs to heart.

18. Match the following list of animals with their level of organization. 2

	Division of Labour		Animal
A	Organ level	(i)	Pheretima
B	Cellular aggregate level	(ii)	Fasciola
C	Tissue level	(iii)	Spongilla
D	Organ system level	(iv)	Obelia

19. Can all the four chambers of the human heart experience systole simultaneously? Explain justifying your answer. 2

20. Bring out any three differences between red muscle fibres and white muscle fibres. 2

21. Represent schematically the formation of ATP through chemiosmosis in a chloroplast. 2

OR

Write four distinguishing features of Phylum Echinodermata

22. There is division of Labour in a chloroplast. Justify. 2

23. Name the three types of cell junctions found in epithelial and other animal tissues. Mention the function of each of them. 2

24. a. Why can cytokinesis not occur in plant cells the same way as it occurs in animal cells? 2
b. How is it accomplished in plant cells?

25. An Rh-negative woman is carrying an Rh-positive fetus for the second time. Describe the consequences of Rh incompatibility in this case? 2

SECTION-C

26. Mitosis results in the production of two cells, which are similar to each other. What would be the consequence of each of the following irregularities that occurs during mitosis? 3

a. Nuclear membrane fails to disintegrate.
b. Duplication of DNA does not occur.
c. Centromere is not divided.
d. Cytokinesis does not occur.

OR

When and why does reduction in the number of chromosomes take place in meiosis?

27. Differentiate between the animals of Chondrichthyes and Osteichthyes. Give six points. 3

28. State the law of limiting factors. Why is there a decrease in the rate of photosynthesis at high light intensities? 3

29. Describe the role of haemoglobin in the transport of respiratory gases. 3

30. Expand PEP. Where is it produced in C4 plants? What is its role in the biosynthetic process? 3

OR

Write four differences between cyclic and non-cyclic photophosphorylation.

SECTION-D

31. Explain the mechanism of urine formation in human beings with a neat, labelled diagram of nephron. 5

OR

Represent diagrammatically a sarcomere and label its parts. Which of these parts shorten during muscle contraction?

32. Supply a specific scientific term for each of the following: 5

i. The period between two successive mitotic divisions.
ii. Process of cell division by which chromosome number is halved.
iii. Point at which two sister chromatids are held together.
iv. Nuclear division in mitosis.
v. Phase in the cell cycle when proteins and RNA are synthesized.

OR

Explain the structure of DNA. Write any three major differences between DNA and RNA.

33. Where does Calvin cycle take place in chloroplast? Describe the three phases of Calvin cycle. 5

OR

Give the schematic representation of EMP pathway and TCA cycle.

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