VIKAS BHARATI PUBLIC SCHOOL
SAMPLE PAPER (SESSION 2023-24)
CLASS XI
SUBJECT: BIOLOGY (044)

Time: 3hrs **M.M.:70**

General Instructions:

(i) **All questions are compulsory.**

(ii) **The question paper has five sections and 33 questions. All questions are compulsory.**

(iii) **Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E 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.**

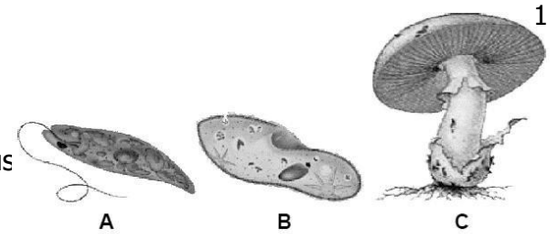
Section – A

1. A student observed an algae with chlorophyll a, b and phycoerythrin, it belongs 1
   a) Chlorophyceae b) Rhodophyceae
   c) Phaeophyceae d) bacteria

2. Which of the following statements is not true for stomatal apparatus? 1
   a) Guard cells invariably possess chloroplasts.
   b) In grasses, the guard cells are bean shaped.
   c) Stomata are involved in gaseous exchange.
   d) The outer walls of guard cells are thin and the inner walls are highly thickened.

3. Binomial nomenclature means that every organism has 1
   a) two names, one scientific and other popular.
   b) one scientific name consisting of a generic name and specific epithet.
   c) one name given by two scientists.
   d) two names, one latinized and other of the person.

4. Identify the following figures A, B and C. 1
   a) A – Euglena, B – Paramecium, C – Agaricus
   b) A – Euglena, B – Planaria, C – Agaricus
   c) A – Planaria, B – Paramecium, C – Agaricus
   d) A – Euglena, B – Paramecium, C – Aspergillus



5. In 'S' phase of the cell cycle 1
   a) amount of DNA doubles in each cell.
   b) amount of DNA remains same in each cell.
   c) chromosome number is increased.
   d) amount of DNA is reduced to half in each cell.

6. Which one of the following kinds of animals are triploblastic? 1
   a) Flatworms b) Sponges
   c) Ctenophores d) Corals

7. You are given a tissue with its potential for differentiation in a tissue culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots? 1
   a) IAA and gibberellin b) Auxin and cytokinin
   c) Auxin and abscisic acid d) Gibberellin and abscisic acid

8. The term 'glycocalyx' is used for 1
   a) a layer present between cell wall and membrane of bacteria.
   b) cell wall of bacteria.
   c) bacterial cell which possess N-glycosylated proteins.
   d) a layer surrounding the cell wall of bacteria.

9. Read the following four statements, (i), (ii), (iii) and (iv) and select the right option having both correct statements. 1
   Statements :
   i) Z scheme of light reaction takes place in presence of PSI only.
   ii) Only PSI is functional in cyclic photophosphorylation.
   iii) Cyclic photophosphorylation results into synthesis of ATP and $NADPH_2$.
   iv) Stroma lamellae lack PSII as well as NADP.
   a) (ii) and (iv) b) (i) and (ii)
   c) (ii) and (iii) d) (iii) and (iv)

10. The majority of carbon dioxide produced by our body cells is transported to the lungs as 1
    a) attached to haemoglobin b) dissolved in the blood
    c) as bicarbonates d) as carbonates.

11. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop. 1
    a) Cytokinin b) Gibberellin
    c) Ethylene d) Abscisic acid

12. Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively? 1
    a) Inflammation of bronchioles; Decreased respiratory surface.
    b) Increased number of bronchioles; Increased respiratory surface.
    c) Increased respiratory surface; Inflammation of bronchioles.
    d) Decreased respiratory surface; Inflammation of bronchioles.

Question Nos. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

    a) Both A and R are true and R is the correct explanation of A.
    b) Both A and R are true and R is not the correct explanation of A.
    c) A is true but R is false.
    d) A is false but R is true.

13. **Assertion:** Chemosynthetic autotrophic bacteria play a great role in recycling nutrients like nitrogen, phosphorous, iron and sulphur.
    Reason: Chemosynthetic autotrophic bacteria does not oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. 1

14. **Assertion:** Mosses reduce the impact of falling rain and prevent soil erosion.
    Reason: Mosses form dense mats on the soil. 1

15. **Assertion:** The scientific names ensure that each organism has only one name.
    Reason: Scientific names are acceptable to biologists all over the world. 1

16. **Assertion:** In alternate type of phyllotaxy, the arrangement of leaves is such that a single leaf arises at each node in alternate manner.
    Reason: The alternate type of phyllotaxy is seen in china rose and mustard plant. 1

Section – B

17. <u>Attempt either option A or B.</u>

    A. Show the difference in the activation energy by a labelled diagram when an enzyme is used and without enzyme. 2

    (OR)

    B. What is meant by secondary and tertiary structure of proteins? 2

18. <u>Attempt either option A or B.</u>

    A. The composition of glomerular filtrate and urine is not the same. Comment. 2

    (OR)

    B. Name the following: ½ x 4 = 2
    i) Cortical portions projecting between the medullary pyramids in the human kidney.
    ii) A loop of capillary running parallel to the Henle's loop.
    iii) Insoluble masses of crystallised salts found within the kidneys.
    iv) Special sensitive region formed by cellular modifications in the distal convoluted tubule and the afferent arteriole at the location of their contact.

19. Name the type of leaves which have the following cells. Also write the function of these cells in leaves. 2
    A) Bulliform cells B) Bundle sheath cells.

20. Name the phytohormone which is in a gaseous state. Write the main role of this phytohormone. 2

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21. Attempt either option A or B.

A. What is resting membrane potential? How does the resting potential change into action potential? 2

(OR)

B. Distinguish between:
   a) afferent neurons and efferent neurons. 1
   b) myelinated nerve fibre and unmyelinated nerve fibre on the basis of their location. 1

Section – C

22. Describe the arrangement of floral members in relation to their insertion on thalamus. 3

23. a) Frogs are not seen during extreme summer and extreme cold conditions. Give reason. 1
    b) Frogs are dioecious and sexually dimorphic. Write two features in which the male frogs can be distinguished from the female frogs, respectively. 2

24. Explain the three phases of interphase of a cell cycle. 3

25. Differentiate between
    a) Direct and indirect development
    b) Pseudo coelomate and coelomate organisms
    c) Radial and bilateral symmetry

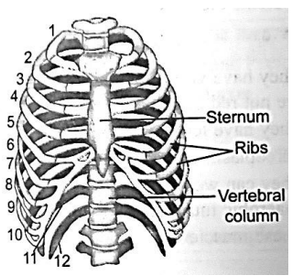
26. How do C3 plants differ from C4 plants? Draw a schematic representation of Hatch and Slack pathway. 3

27. A. Write structural formula of ribose sugar. How does it differ from Deoxyribose Sugar? 1
    B. Write name and structural formula of any one Amino Acid. 1
    C. Write components of Nucleosides. 1

28. Explain the mechanism of coagulation of blood. 3

Section – D

29. A diagram of human rib cage is given below. Observe the diagram and answer the following questions:



   A. Why are the ribs described as bicephalic? 1
   B. How many bones are there in a rib cage? 1

   Attempt either subpart C or D.

   C. What are true ribs? How many true ribs are present in the human rib cage? 2

   (OR)

   D. What are vertebrochondral ribs? How many of them are there in a human rib cage? 2

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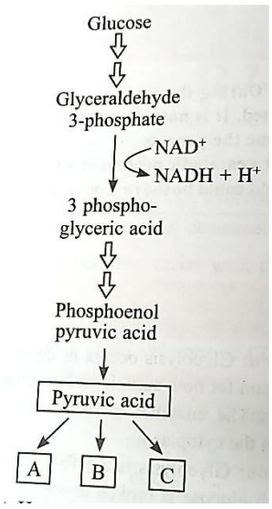
30. Observe the simplified form of glycolysis shown in the flow chart given below, where pyruvic acid is the end product and answer the questions that follows:



A. How many molecules of pyruvic acid are formed from one molecule of glucose during glycolysis? 1

B. Write the three metabolic fates A,B,C of the pyruvic acid and mention against each as aerobic or anaerobic condition. 1

Attempt either subpart C or D.

C. Write the two steps in the glycolysis, where ATP is consumed. 2

(OR)

D. How is the fructose 6- phosphate formed from glucose during glycolysis? 2

Section – E

31. Attempt either option A or B.

A. Name the hormone that regulates each of the following and mention the source of it. 5

a) Urinary elimination of water. b) Storage of glucose as glycogen.
c) Na+ and K+ metabolism. d) Basal metabolic rate
e) Descent of testes into scrotum

(OR)

B. a) A patient was complaining of frequent urination, excursive thirst, hunger and tiredness. His fasting glucose level was found higher than 130 mg / dL on two occasions: 3

i) Name the disease
ii) Give the root cause of this disease
iii) Explain why the blood glucose level is higher than 130 mg / dL?

b) In general, how do steroid hormones effect the changes in their target cells. Explain with only diagram. 2

32. Attempt either option A or B.

A. A cell organelle is also considered as the power house of the cell.

i) Identify the cell organelle. ½
ii) Describe the structure of this organelle with the help of a labelled diagram. 4½

(OR)

B. i) Differentiate between RER and SER. 2
ii) Classify the plastids on the basis of the types of pigments found in them. State the function of each type. 3

33. Attempt either option A or B.

A. Give a brief account of viruses with respect to their structure and nature of genetic material. Draw a labelled diagram to explain the structure. Also name four common viral diseases. 5

(OR)

B. i) Mention the ploidy of the following: protonemal cell of a moss; leaf cell of a moss; prothallus cell of a fern; gemma cell in Marchantia; ovum of a liverwort, zygote of a fern. 3

ii) Mention two adaptations in the conifers to check the water loss from the plant. 2

-x-x-x-x-x-x-x-x-x-