VIKAS BHARATI PUBLIC SCHOOL

SAMPLE PAPER (SESSION 2024-25)

CLASS XI

SUBJECT: BIOLOGY

Time: 3hrs M.M.:70

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. 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.
4. 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.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.
6. This question paper contains 7 printed pages.

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|  | **SECTION A** |  |
| **1.** | Each part of plant breathes on its own. Roots of plants in haline marshy soil get  suffocated if these do not have  a. Mycorrhizae b. Pneumatophores  c. Haustoria d. Rhizoids | **1** |
| **2.** | Given below are some bacteria and their shapes. Select the correct match  Bacteria Shape  A Lactobacillus i Comma  BStreptococcus ii spherical  C Vibrio cholerae iii Rod  iv Spiral  a. A-i, B-ii, C-iv b. A-iii, B-ii, C-i  c. A-iii, B-iv, C-ii d. A-ii, B-iii, C-iv | **1** |
| **3** | Given below are different sub-stages of prophase I. Match them with their correct  feature.  Column I Column II  1 Zygotene i Formation of bivalent  11 Pachytene ii Terminalization of chiasmata  Diakinesis iii Dissolution of synaptonemal complex  IV Leptotene iv Crossing over mediated by recombinase  V Diplotene v chromosomes start condensing  a. 1-v, II-i, III-iv, IV-iii, V-ii b. 1-i, Il-iii, III-ii, IV-v, V-iv  c. 1-1, 11-iv, III-ii, IV-v, V-iii d. I-v, Il-iv, III-ii, IV-i, V-iii | **1** |
| **4** | The sodium-potassium pump across the neuronal membrane transports  (a) 3 Na+ to the outside and 2K+ into the cell  (b) 2 Na+ to the outside and 3K+ into the cell  (c) 3 Na+ into the cell and 2K+ to the outside  (d) 2 Na+ into the cell and 3K+ to the outside | **1** |
| **5** | Cloaca is a median chamber that is used to pass  (a) urine (b) faecal matter  (c) sperms (d) all of these | **1** |
| **6** | Systema Naturae was published by  (a) Charles Darwin (b) Hutchinson  (c) Carolus Linnaeus (d) Theophrastus | **1** |
| **7** | Taxonomic hierarchy refers to  (a) a group of senior taxonomists, who decide the nomenclature of organisms.  (b) a step-wise arrangement of all the taxonomic categories of plants and animals.  (c) a list of botanists or zoologists, who have worked on the taxonomy of a species or a group.  (d) collection of seeds or pollen grains of rare and threatened species of a group or an area. | **1** |
| **8** | The excretory organs of Platyhelminths, are  (a) nephridia. (b) flame cells.  (c) nephrons. (d) kidneys. | **1** |
| **9** | Bulliform cells are characteristically found in  (a) dicot leaves (b) grass blades  (c) dicot stems (d) monocot stems | **1** |
| **10** | Functional residual capacity in humans refers to the volume of air, which  (a) can be breathed out by forceful expiration  (b) remains in the lungs after normal expiration  (c) remains in the lungs after forceful expiration  (d) can be breathed in by forceful inspiration | **1** |
| **11** | During anaphase-I of meiosis  (a) homologous chromosomes separate  (b) non-homologous chromosomes separate  (c) sister chromatids separate  (d) non-sister chromatids separate | **1** |
| **12** | Which range of wavelength (in nm) is called photosynthetically active radiation (PAR)?  (a) 100 - 390  (b) 390 - 430  (c) 400 - 700  (d) 760 – 100,00 | **1** |
|  | **Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R).** Answer these questions 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: Sap vacuoles are bounded by tonoplast.  Reasons: They are responsible for decolourisation of petals | **1** |
| **14** | Assertion: A cell membrane shows fluid behavior.  Reasons: A membrane is a mosaic or composite of diverse lipids and proteins. | **1** |
| **15** | Assertion; Respiratory Pathway is amphibolic pathway  Reason: In respiration, there is breakdown of many substances (catabolism) and synthesis of many substances (anabolism) by respiratory intermediates. | **1** |
| **16** | Assertion: A coenzyme or metal ions that is very tightly bound to enzyme protein is called prosthetic group.  Reason: A complete, catalytically active enzyme together with its bound prosthetic group is called apoenzyme. | **1** |
|  | **SECTION B** |  |
| **17** | Bring out two major differences between bryophytes and pteridophytes. | **2** |
| **18** | Match Column I with Column II.   |  |  | | --- | --- | | Column I | Column II | | A. Ethylene  B. Cytokinins  C. Abscisic acid  D. Gibberellins | 1. Stomatal closure  2. Bolting in rosette plants  3. Fruit ripening  4. Promote cell division. | | **2** |
| **19** | Differentiate between dicot stem and dicot root on the basis of their vascular bundles. | **2** |
| **20** | Explain the type of nervous system in frogs. | **2** |
| **21** | (a) What is the function of carbonic anhydrase? (b) How many times does carbonic anhydrase accelerate the reaction? | **2** |
|  | **SECTION C** |  |
| **22** | A) It regulates the secretion of digestive enzymes. B) It promotes sperm  production in males. C) It influences the development o  Identify the Endocrine glands represented by C and F. Mention the hormones secreted by them and the functions of these hormones. |  |
| **23** | Figure given shows the effect of light on the rate of photosynthesis. Based on the graph, answer the following questions: (a) At which point(s), (A, B or C), in the curve is light a limiting factor? (b) What could be the limiting factor(s) in region A? (c) What do C and D represent on the curve? .  **OR**  A cyclic process is occurring in C3 plants, which is light-dependent and needs O2. This process does not produce energy, but rather consumes energy. (a) Can you name the given process? (b) Is it essential for survival? (c) What are the end products of this process? | **3** |
| **24** | Identify the organelle .Fill in the blanks at (A), (B), (C), and (D) as shown in diagram. | **3** |
| **25** | Draw a labelled diagram to show the different regions of a root. | **3** |
| **26** | What is diatomaceous earth? Mention any two economic uses of it. | **3** |
| **27** | Represent schematically the pathway of fermentation of lactic acid. | **3** |
| **28** | Describe the internal structure or anatomy of a human kidney. | **3** |
|  | **SECTION D** |  |
|  | Q.no 29 and 30 are Case Based questions. Each question has subparts with internal choice in one subpart. |  |
| **29** | Exchange of gases also occurs between blood and tissues. O2 and CO2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient. The solubility of the gases, as well as the thickness of the membranes involved in diffusion, are also some important factors that can affect the rate of diffusion  . i. Pressure contributed by an individual gas in a mixture of gases is called \_\_\_\_\_\_\_\_.  a. Atmospheric pressure b. Partial pressure c. Differential pressure d. Capillary pressure  ii. \_\_\_\_\_\_\_\_ are the primary sites of exchange of gases.  a. Alveoli b. Diaphragm c. Trachea d. Bronchi  iii. The diffusion membrane is made up of \_\_\_\_\_\_\_\_\_ major layers.  a. Two b. Four c. Three d. Five  iv. What are the values of pO2 and pCO2 in the body tissues?  a. pO2 – 104 mm Hg, pCO2 – 40 mm Hg b. pO2 – 104 mm Hg, pCO2 – 140 mm Hg  c. pO2 – 95 mm Hg, pCO2 – 40 mm Hg d. pO2 – 40 mm Hg, pCO2 – 45 mm Hg | **4** |
| **30** | Plastids are found in all plant cells and in euglenoids. These are easily observed under the microscope as they are large. They bear some specific pigments, thus imparting specific colours to the plants. Plastids consist of numerous membrane layers embedded in a material called the stroma. They have their own genome and ribosomes  . i. The \_\_\_\_\_\_\_\_ are the colourless plastids of varied shapes and sizes with stored nutrients  . a. Leucoplasts b. Chloroplasts c. Chromoplasts d. Carotenoids  ii. The \_\_\_\_\_\_\_\_\_\_ store fats and oils in grains.  a. Amyloplasts b. Aleuroplasts c. Elaioplasts d. Carotenoid  iii. Which type of plastid stores carbohydrates in potatoes?  a. Amyloplasts b. Aleuroplasts c. Elaioplasts d. Carotenoid  iv. The space limited by the inner membrane of the chloroplast is called  a. Matrix b. Cytoplasm c. Stroma d. Lumen | **4** |
|  | **SECTION E** |  |
| **31** | Explain the steps of calvin Cycle  OR  Diagrammatically represent the chemiosmotic bypothesis of chloroplast | **5** |
| **32** | Explain the Conduction of nerve impulse along a nerve fiber.  OR  Describe the sequence of events which occurs in the cardiac cycle in humans. Where and how are the sounds of ‘lubb’ and ‘dubb’ produced in the heart during this cycle? | **5** |
| **33** | . a.) Differentiate between the animals of ascelminthes and annelida(any three differences)  b.) What is Metagenesis? Mention one example which exhibit this phenomenon.  OR  a) Describe briefly any three major groups of protozoa.  b) Differentiate between the different classes of algae. | **5** |