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Class XI

Cumulative Examination

Biology (Subject Code-044)

Maximum Marks: 70 Time: 3 hours

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		
Q.No.	**Questions**	Marks
1	Some phylum and classes are mentioned below with examples. Select the correct from the following- i. Arthropoda - ***Apis, Pila*** ii. Amphibia - ***Rana, Hyla*** iii. Aves - ***Columba, Psittacula*** iv. Coelenterata - ***Physalia, Asterias*** a. (i) and (ii) is correct b. (ii) and (iii) is correct c. (iii) and (iv) is correct d. (iv) and (i) is correct	**1**
2	Schleiden and Schwann formulated cell theory, but did not explain about the cells are formed by the cells. In 1855 another scientist first explained as to how new cells were formed. Identify the name of the scientist who firstly explained that cells divided and new cells are formed from pre-existing cells- a. Leeuwenhoek b. Ramchandran c. Virchow d. Christian Gram	**1**
3	In leaves of some plants the veins modify themselves into large, empty and colourless cells. These modified cells are responsible for exposed and curling of leaves. The name of the cells is a. bundle sheath cells b. bulliform cells c. mesophyll d. casparian strip	**1**
4	The ribosomes are granular structure, they are present in prokaryotic and eukaryotic cells. The chief function of the ribosome is protein synthesis. The size of the ribosomes is different in both type of the cells. Select the correct unit used to measure the ribosomes a. Pascal b. Density gradient c. Svedberg's d. Micron	**1**
5	Each category, referred to as a unit of classification, in fact, represents a rank and is	**1**

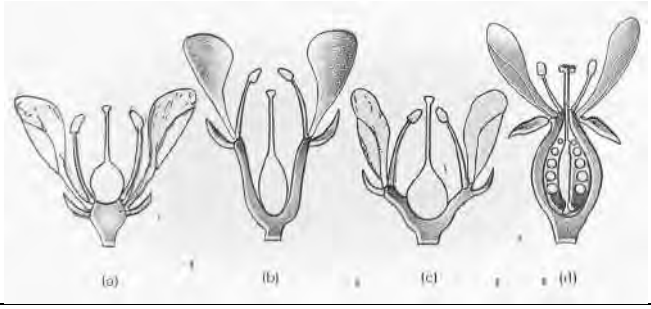
	commonly termed as a. Genus b. Taxon c. Taxonomy d. All are correct	
6	The protein is made up of amino acids. The amino acids show variety of features. Some of them are considered as aromatic amino acids. Select the amino acid which is not aromatic from given below. a. tyrosine b. phenylalanine c. tryptophan d. Glycine	**1**
7	The structure of chloroplast consisting lamellar and liquid portion. The liquid portion is called as stroma. In stroma what would be synthesize during the process of photosynthesis? a. Sugar b. Carbon c. Hydrogen d. Cellulose	**1**
8	The metamorphosis is a process by which the early form of organism is changed into different adult form through various stages. What is the best suitable example you have studied from given below? a. human beings b. Snakes c. Frog d. Amoeba	**1**
9	Cells which fix atmospheric nitrogen is called as a. Statocyst b. Blastocyst c. Homocyst d. Heterocyst	**1**
10	The normal process of photosynthesis is affected by the several factors. The rate of photosynthesis is determined by the factor which is nearest to its minimal value. This concept is given by a. Cornelius Van Niel (1897-1985) b. Joseph Priestley (1733-1804) c. Blackman's (1905) d. T.W. Engelmann (1843-1909)	**1**
11	During the starch test, when Iodine is mix with starch, it will give starch-I_2 in blue colour. It confirms that the starch is present in the sample. Why starch give positive Iodine test and cellulose not? a. Starch forms secondary helical structure b. Cellulose forms different helical structure c. the starch is soluble in any of the solution d. no any above given statement is correct	**1**
12	The ***Gelidium*** and ***Gracilaria*** is a source of a. algin b. agar c. carrageen d. No any correct	**1**

Assertion (A) – Reason (R) type questions

Note: For this type of questions, the correct answer should be selected from following options.

a. Both assertion and reason are correct and reason is correct explanation for assertion.
b. Both assertion and reason are correct and reason is not correct explanation for assertion.
c. Assertion is correct but reason is incorrect.

	d. Both assertion and reason are incorrect.	
13	**Assertion (A) -** Frogs are beneficial for mankind because they eat insects and protect the crop. **Reason (R) -** Frogs maintain the ecological balance because these serve as an important link of food chain and food web in the ecosystem.	**1**
14	**Assertion (A) -** The interphase lasts more than 95% of the duration of cell cycle. **Reason (R) -** The Cell division proper lasts for only about an hour.	**1**
15	**Assertion (A) -** In dicotyledonous vascular bundles, the secondary xylem and secondary phloem formation tissue is present. **Reason (R) -** This type of the vascular bundles are called as 'open vascular bundles'.	**1**
16	**Assertion (A) -** In Amoeba the contractile vacuole is important for osmoregulation and excretion. **Reason (R) -** In many cells, as in protists, food vacuoles are formed by engulfing the food particles.	**1**
	SECTION B	
17	The bacteria show various shapes, so they are divided on the basis of the different shapes. Write the names of all shapes given with simple diagram.	**2**
18	Who proposed the fluid mosaic model of plasma membrane? Why it is described as bilayer?	**½+1½ =2**
19	The floral diagram of a plant is given below. Identify the family of this floral diagram and write most important feature present in this diagram. (1+1) 	**2**
20	In the structure of the eukaryotic cells, various cell organelles are present to perform various important functions. For this purpose, one of them plays important role to generate energy. Write the name of this cell organelles and write the important functions. Or In Meiosis, during the sub-stages of Prophases I, formation of a complex structure called as synaptonemal complex. What is the important function of this complex structure?	**2**
21	In the history of the classification, two kingdom system of classification was also proposed. Though it was proposed in time of a famous biologist but not used so far. What are the two important drawbacks of two kingdom classification?	**2**
	SECTION C	
22	Phyllotaxy is the pattern of arrangement of leaves on the stem or branch. Mention the all types of phyllotaxy with a suitable example in each present in plants.	**3**
23	Mention at least four important features of any one from the following with suitable example. a. Reptilia b. Aves	**3**

24	The enzymes are called as the biocatalyst, they increase the rate of the reaction. The enzymes are classified of the basis of types of the reactions performed. What is the nature of enzyme action?	**3**
25	The diagram related to the position of floral parts on thalamus. Describe the all types of flowers on the basis of position.  	**3**
26	The bacteria are found everywhere and performs various functions in the atmosphere also in living beings. They are divided into two types Archaebacteria and Eubacteria. How these two types of bacteria are different from each other.	**3**
27	The chromosomes are classified on the basis of presence of centromere at different positions in them. Describe the types of chromosomes based on the position of centromere with diagrams. (2+1)	**3**
28	Draw any one diagram with at least three labelling from the following- a. Diagrammatic representation of stomata b. Male reproductive system of Frog	**3**
	SECTION D	
Note: Read the passage of case study and answer the questions given below in case studies given in question 29 and 30.		
29	**Gymnosperms** are older than angiosperms on the evolutionary scale. They are found far earlier in the fossil record than angiosperms. As will be discussed in subsequent sections, the various environmental adaptations gymnosperms have represent a step on the path to the most successful (diversity-wise) clade (monophyletic branch).  The gymnosperms are plants in which the ovules are not enclosed by any ovary wall and remain exposed, both before and after fertilisation. The seeds that develop post-fertilisation, are not covered, i.e., are naked. Gymnosperms include medium-sized trees or tall trees and shrubs. One of the gymnosperms, the giant redwood tree Sequoia is one of the tallest tree species. The roots are generally tap roots. Roots in some genera have fungal association in the form of mycorrhiza (Pinus), while in some others (Cycas) small specialised roots called coralloid roots. The leaves may be simple or compound. In Cycas the pinnate leaves persist for a few years. The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind. In conifers, the needle-like leaves reduce the surface area. Their thick cuticle and sunken stomata also help to reduce water loss.	**4**

	Answer the following questions- **(i) In gymnosperms, seeds that develop after fertilisation are _____** a) Covered in ovary walls b) Not covered in ovary walls c) Covered in ovary sheath d) None of the above **(ii) Identify the correct characteristics of Cycus** Characteristic 1 – Leaves pinnate for a few years Characteristic 2 – Small specialised coralloid roots present Characteristic 3 – Roots are associated with nitrogen fixing bacteria Characteristic 4 – Male and female cone are present on different plant a) Both 2 and 3 b) Only 2 c) 1, 2 and 3 d) All of the above **(iii) Name the special type of root found in Cycus tree with function .** **Or** **What is the reason behind needle-like leaves adaptation in gymnosperms?**	
30	**Biomolecules** In a polypeptide or a protein, amino acids are linked by a bond. The amino acid consisting one carboxyl (-COOH) group, one amino ($-NH_2$) group and a side group R, the R is varying in different amino acids. The amino acids may be essential or non-essential. In a polysaccharide the individual monosaccharides are linked by a bond. This bond is also formed by dehydration. This bond is formed between two carbon atoms of two adjacent monosaccharides. In a nucleic acid a phosphate moiety links the 3'-carbon of one sugar of one nucleotide to the 5'-carbon of the sugar of the succeeding nucleotide. The bond between the phosphate and hydroxyl group of sugar is an ester bond. As there is one such ester bond on either side, it is called phosphodiester bond. Nucleic acids exhibit a wide variety of secondary structures. For example, one of the secondary structures exhibited by DNA is the famous Watson – Crick Model. This model says that DNA exists as a double helix. The two strands of polynucleotides are antiparallel i.e., run in the opposite direction. The backbone is formed by the sugar-phosphate-sugar chain. The nitrogen bases are projected more or less perpendicular to this backbone but face inside. A and G of one strand compulsorily base pairs with T and C, respectively, on the other strand. There are hydrogen bonds between A and T and between G and C. Each strand appears like a helical staircase. **Answer the following questions-** **(i) To form polypeptide molecules, number of amino acids joined together by -** a) Covalent bond b) Glycosidic bond c) Peptide bond d) Phosphodiester bond **(ii) Number of monosaccharides are joined together by _____ to form polysaccharide.** a) Phosphodiester bond b) Glycosidic bond c) Hydrogen bond d) Ester bond	**1+1+2 =4**

	(iii) How the essential and non-essential amino acids are different? **Or** **Name the bond present between nitrogen bases (A and G / T and C) of nucleic acid. In what number the bonds are present between them?**	
	SECTION E	
31	Write the important differences between the following (2+2+1) a. Monocotyledonous Stem and Dicotyledonous Stem b. Isobilateral Leaf and Dorsiventral Leaf c. What is the function of root cap in plants? Or Write the answers of the following (2+2+1) a. What is inflorescence? Describe the important types of inflorescences. b. What is venation? How many types of venations is present in the leaves of various plants. Describe and mention in which type of plants it is present? c. Draw the main types of the roots are present in plants.	**5**
32	The names of the living organisms are different in the different languages as well as in the countries. This is a great issue for a common name. Biological scientist develops the naming system of living organisms. Answer the following questions- (1+3+1=5) a. Who proposed the binomial nomenclature of classification? b. Write the universal rules of nomenclature of living organism? c. On the basis of such rules write the biological names of the following organism- House fly and Wheat Or Write details of any two (2½ + 2½) a. Symmetry in animals b. Types of Coelom in animals c. Justify the following statement "All vertebrates are chordates but all chordates are not vertebrates".	**5**
33	In concept of photosynthesis two types of the reactions are describe about the process of light reaction. One is according to the photosystem I and II, another is cyclic and non-cyclic photophosphorylation. Describe the reaction which is called as 'Z' scheme of photosynthesis. Or The Calvin cycle is present in all photosynthetic plants; it does not matter whether they have C_3 or C_4 or any other pathway. This process is directly related to the biosynthetic phase. Describe the all steps of Calvin Cycle with diagram.	**5**