SET-2
Class XI (2022-23)
Biology (044) Theory
Half Yearly Examination

Time: 3 Hours **Maximum Marks: 70**

General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.
(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 and Section–D has 02 case-based questions of 4 marks each and Section–E has 3questions 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 labelled diagrams should be drawn.

SECTION: A		
Q.No.	Questions	Marks
1	Name a unicellular alga rich in proteins is used as food supplement by space travellers.	1
2	Name the smallest and the largest isolated single cell.	1
3	Which biomacromolecule consists of a sugar, a heterocyclic compound and a phosphoric acid molecule?	1
4	What is a parthenocarpic fruit?	1
5	What for Matthias Schleiden and Theodore Schwann known?	1
6	Can you name the only organism who is aware of himself i.e. has self-consciousness?	1
7	Name a non- cellular organism that is characterised by having an inert crystalline structure outside the living cell.	1
8	Draw the structure of the amino acid, alanine.	1
9	What are Casparian strips present in dicot roots ?	1
10	Frogs are not seen during peak summer and winter. How do they protect them?	1
11	How can Male frogs be distinguished from female frogs morphologically?	1
12	What are acoelomate animals ?Give example.	1
13	What are bulliform cells and where are these found?	1
14	**Assertion:** Algae are useful to man in a variety of ways. At least a half of the total carbon dioxide fixation on earth is carried out by algae through photosynthesis. Being photosynthetic they increase the level of dissolved oxygen in their immediate environment. **Reason:** They are of paramount importance as primary producers of energy-rich compounds which form the basis of the food cycles of all aquatic animals. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false. **OR**	1

	Assertion: Certain marine brown and red algae produce large amounts of hydrocolloids (water holding substances). **Reason:** Algin (brown algae) and carrageen (red algae) which are used commercially. 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.	
15	**Assertion:** The cyanobacteria (also referred to as blue-green algae) have chlorophyll a similar to green plants and are not photosynthetic autotrophs. **Reason:** Nostoc and Anabaena are chemosynthetic autotrophic bacteria which oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1
16	**Assertion:** The arrangement of ovules within the ovary is knownas placentation. **Reason:** The placentation is of different types namely,valvate, twisted, imbricate, and vexillary. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1
	SECTION: B	
17	Name two commercial products and their source which are obtained from algae.	2
18	How are viroids different from viruses?	2
19	Differentiate between Prosthetic groups and Co-enzymes.	2
20	How does the position of centromere form the basis of classification of chromosomes? Support your answer with a diagram showing the position of centromere on different types of chromosomes.	2
21	Draw a neat and labelled diagram of digestive system of frog.	2
	SECTION: C	
22	What is competitive inhibition? How do concentration of substrate affects enzyme activity	3
23	Match the following Column I — Column II (a) Cristae — (i) Flat membranous sacs in stroma (b) Cisternae — (ii) Infoldings in mitochondria (c) Thylakoids — (iii) Disc-shaped sacs in Golgi apparatus	3
24	Describe the arrangement of floral members in relation to their insertion on thalamus.	3
25	Describe the catalytic cycle of an enzyme action in steps.	3

<table>
<tr><td>26</td><td>Match the following:<table><tr><td>(a) Operculum</td><td>(i) Ctenophora</td></tr><tr><td>(b) Radula</td><td>(ii) Annelida</td></tr><tr><td>(c) Scales</td><td>(iii) Porifera</td></tr><tr><td>(d) Comb plates</td><td>(iv) Osteichthyes</td></tr><tr><td>(e) Parapodia</td><td>(v) Mollusca</td></tr><tr><td>(g) Choanocytes</td><td>(vi) Reptilia</td></tr></table>OR
(a)How important is the presence of air bladder in Pisces?
(b) What are the modifications that are observed in birds that help them fly?</td><td>3</td></tr>
<tr><td>27</td><td>Explain how Frogs are beneficial for mankind?</td><td>3</td></tr>
<tr><td>28</td><td>What is stomatal apparatus? Explain the structure of stomata with a labelled diagram.</td><td>1+2=3</td></tr>
<tr><td></td><td>SECTION: D</td><td></td></tr>
<tr><td>29</td><td>Read the following and answer any four questions from 15(i) to 15(v) given below:
Phylum Chordata is divided into three subphyla: Urochordata or Tunicata, Cephalochordata and Vertebrata. Vertebrates have a ventral muscular heart with two, three or four chambers, kidneys for excretion and osmoregulation and paired appendages which may be fins or limbs. Phylum Chordata includes animals which possess a notochord either throughout or during early embryonic life. Other common features observed in the chordates are the dorsal, hollow nerve cord and paired pharyngeal gill slits. The subphylum Vertebrata is further divided as 2 divisions-Agnatha and Gnathostomata. Some of the vertebrates do not possess jaws (Agnatha) whereas most of them possess jaws (Gnathostomata). Agnatha is represented by the class, Cyclostomata. They are the most primitive chordates and are ectoparasites on fishes. Gnathostomata has two super classes- Pisces and Tetrapoda. Classes Chondrichthyes and Osteichthyes bear fins for locomotion and are grouped under Pisces. The Chondrichthyes are fishes with cartilaginous endoskeleton and are marine. Classes ,Amphibia, Reptilia, Aves and Mammalia have two pairs of limbs and are thus grouped under Tetrapoda. The amphibians have adapted to live both on land and water. Reptiles are characterised by the presence of dry and cornified skin. Limbs are absent in snakes. Fishes, amphibians and reptiles are poikilothermous (cold blooded). Aves are warm-blooded animals with feathers on their bodies and forelimbs modified into wings for flying. Hind limbs are adapted for walking, swimming, perching or clasping. The unique features of mammals are the presence of mammary glands and hairs on the skin. They commonly exhibit viviparity.</td><td>4</td></tr>
<tr><td>i</td><td>Based on above information, which classification is most appropriate for yourself-
a. Class- Mammalia, Super class-Tetrapoda, Division- Gnathostomata, Subphylum-Vertebrata and Phylum- Chordata.
b. Class- Mammalia, Super class- Gnathostomata, Division- Tetrapoda, Subphylum-Vertebrata and Phylum- Chordata.
c. Class- Tetrapoda, Super class-Mammalia, Division- Gnathostomata, Subphylum-Vertebrata and Phylum- Chordata.
d. None of these.</td><td></td></tr>
<tr><td>ii</td><td>A jaw-less vertebrate would belong to-
a. Class- Pisces
b. Class- Chondrichthyes</td><td></td></tr>
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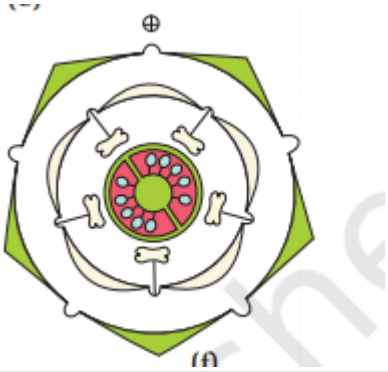
	c. Class- Osteichthyes d. Class- Cyclostomata	
iii	Choose the best from the options given below for warm blooded animals exhibiting vivipary, with hairs on skin, air bladder, forelimbs modified into wings for flying and adapted to live on land and water would be members of- a. Super class Pisces b. Phylum Chordata c. Division Gnathostomata d. Class Mammalia	
iv	Which is the correct statement? a. Reptiles are characterised by the presence of dry and cornified skin. Limbs are present in snakes. b. The Chondrichthyes are fishes with bony endoskeleton and are marine. c. Phylum Chordata includes animals which possess a notochord either throughout or during early embryonic life. d. Chondrichthyes and Osteichthyes bear fins for locomotion and are grouped under Tetrapoda.	
v	**Assertion:** Aves are warm-blooded animals with feathers on their bodies and forelimbs modified into wings for flying. Endoskeleton is fully ossified (bony) and the long bones are hollow with air cavities (pneumatic). **Reason:** Pneumatic bones help them to fly. 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	
30	***Read the following and answer any four questions from 16(i) to 16(v) given below:*** A student was asked to observe following diagram displayed on a chart in Biology laboratory and draw conclusion based on choices given below. Mark your own opinion in any of the 4 choices- 	4
i	The above diagram shows the floral diagram of- a. Potato b. Makoi c. Petunia d. all of these	1

ii	The correct floral formula can be written as - a. $\oplus$ K_{2+2} C_4 A_{2+4} $G_{(2)}$ b. % $K_{(5)}$ $C_{1+2+(2)}$ $A_{(9)+1}$ G_1 c. Br $\oplus$ $P_{(3+3)}$ A_{3+3} $G_{(3)}$ d. None of the above	1
iii	Gynoecium is correctly marked as- a. bicarpellary obligately placed, syncarpous; ovary superior, bilocular, placenta swollen with many ovules, axile b. ovary superior, mono carpellary, unilocular with many ovules, style single c. tricarpellary, syncarpous, ovary superior, trilocular with many ovules; axile placentation d. bicarpellary, syncarpous, ovary superior, trilocular with many ovules; axile placentation	1
iv	Flower is- a. bisexual, actinomorphic b. bisexual, zygomorphic c. unisexual, zygomorphic d. unisexual, actinomorphic	
v	Androecium shows- a. stamen six, 3+3, epitepalous b. stamens 10, diadelphous c. stamens 10, epitepalous d. stamens 5, epitepalous	
	SECTION:E	
31	(a)Name two cell-organelles that are double membrane bound. State their functions. (b)Draw a well labelled diagram of fluid mosaic model of plasma membrane.	2+3=5
32	(a) What is heterospory? Briefly comment on its significance. Give two examples. (b) Match the following (column I with column II) Column I — Column II (a) Chlamydomonas — (i) Moss (b) Cycas — (ii) Pteridophyte (c) Selaginella — (iii) Algae (d) Sphagnum — (iv) Gymnosperm OR Explain briefly the following terms with suitable examples:- (i) protonema (ii) antheridium (iii) archegonium (iv) sporophyll (v) isogamy	3+2=5 OR 1*5=5
33	(a) Describe briefly the sexual cycle in fungi. (b) What do the terms phycobiont and mycobiont signify? OR Explain 5 kingdoms as proposed by R.H.Whittaker with 5 main criteria for classification used by him.	5

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