

# Sample Question Papers

**CBSE** Examination **Class XI**

# Biology

2010-2015

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**Class-XI**  
**BIOLOGY (THEORY)**

**Time: 3 Hrs**

**MM: 70**

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**General Instructions**

1. The question paper comprises of five Sections A, B, C, D and E.
2. All questions are compulsory.
3. There is no overall choice however; internal choice has been provided in one question of 2 marks, one question of 3 marks and all the two questions of five marks category. Only one option in such question is to be attempted.
4. Questions 1 to 5 in section A are very short questions of one mark each. These are to be answered in one word or one sentence each.
5. Questions 6 to 9 in section B are short questions of two marks each. These are to be answered in approximately 20-30 words each.
6. Questions 10 to 20 in section C are questions of three marks each. These are to be answered in approximately 30-50 words each. Question 21 is of 4 marks.
7. Questions 22 to 23 in section D are questions of five marks each. These are to be answered in approximately 80-120 words each.
8. Questions 24 to 26 in section E is based on OTBA of 10 marks.

**Section - A**

1. Define metamerism. Give an example.
2. Give an example of zwitter ionic form.
3. Draw a graph of oxygen dissociation curve.
4. Show the taxonomic categories in hierarchical arrangement in ascending order.
5. What are uricotelic animals? Give example.

**Section - B**

6. Define the terms isotonic and solute potential?
  7. What is mesosome in a prokaryotic cell? Mention any two functions it performs.
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8. Bring out the differences between the stele of dicot root and monocot root.
  9. (i) Name two red algae from where agar is obtained.  
(ii) What is alternation of generations?

Or

What is meant by a heterosporous fern? Give two examples?

### **Section - C**

10. What are tap root system and fibrous root system? Give an example for each.
11. Explain cell theory.
12. Write a note on primary and secondary structure of proteins with a neat sketch.
13. What are the key features of metaphase and prophase?
14. Draw a well labelled diagram of head region of a cockroach.

Or

Draw a labelled diagram of structure of neuron.

15. Bring out the role of haemoglobin in the transport of respiratory gases.
  16. How is a nerve impulse conducted along a non- myelinated nerve fibre
  17. Write a short note on euglenoids with the structure of Euglena.
  18. Explain briefly about the phloem parenchyma and phloem fibres.
  19. Draw a graph to explain the concept of activation of energy.
  20. Explain the role of calcium to plants.
  21. **Rashmi was a social worker in rural area. One day she met a lady. The lady discussed her problem about forceful termination of her Foetus for many times due to female child. Next day, Rashmi meets the parents in laws of the lady and**
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explained about the importance of girl child. Next time the lady was not forced to undergo termination.

- a. What values do you find in Rashmi?
- b. Which procedure is used to know the sex of Foetus?
- c. How this practice is unlawful?

**Section - D**

22. Explain in detail about Solanaceae.

Or

Give the physiological effects of Gibberellins and Cytokinins

23. What are the factors that affect photosynthesis?

Or

What are the disorders of muscular and skeletal system?

**Section-E (OTBA) Questions**

- |     |               |        |
|-----|---------------|--------|
| 24. | OTBA Question | 2 mark |
| 25. | OTBA Question | 3 mark |
| 26. | OTBA Question | 5 mark |

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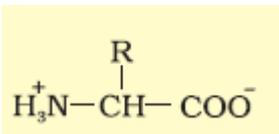
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ANSWERS

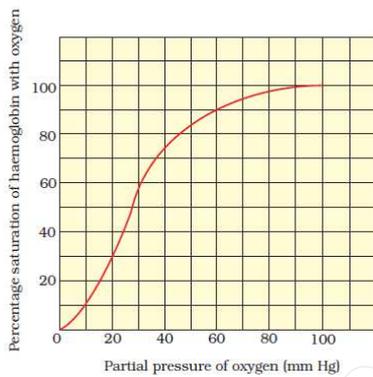
Section-A

1. In some animals, the body is externally and internally divided into segments with a serial repetition of at least some organs is called metamerism. Eg – Earthworm.

2.



3.



4.



5. Reptiles, birds, land snails and insects excrete nitrogenous wastes as uric acid in the form of pellet or paste with a minimum loss of water and are called uricotelic animals.

Section-B

6. The solution is said to be isotonic if it balances the osmotic pressure of the cytoplasm. i.e., it has the same solute concentration.
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7. Mesosomes are the extensions of the plasma membrane into the cell especially in prokaryotes. They may be in the form of (i) vesicles (ii) tubules and (iii) lamellae.

Functions:

- a) They are involved in cell wall formation during cell division.
- b) They help in DNA replication and its distribution to daughter cells.

8.

Dicot Root	Monocot Root
Vascular bundles are usually tetrarch.	Vascular bundles are polyarch
Pericycle is involved in secondary growth and is not lignified.	Pericycle becomes lignified, since it is not involved in secondary growth.

9.

- i) Gelidium, Gracilaria.
- ii) It is the phenomenon in which there is alternation between the gametophytic haploid phase and the sporophyte / diploid phase of the life cycle.

Or

Heterosporous ferns are ferns that produce two types of spores, namely microspores and megaspores. Examples – Marsilea, Salvinia.

### **Section-C**

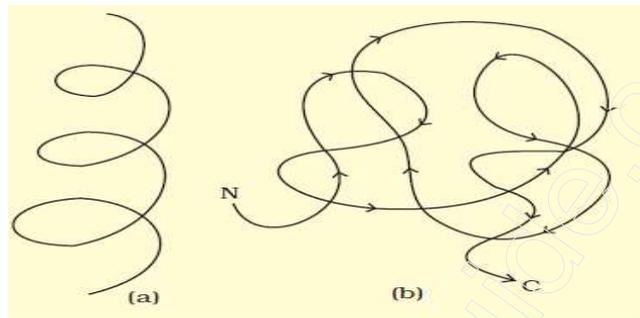
10. The primary roots and its branches constitute the tap root system. Example – Mustard Plant. In monocot plants, the primary root is short lived and is replaced by a large number of roots. These roots originate from the base of the stem and constitute the fibrous root system. Example - Wheat plant.
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11. Cell theory defines as:

- (i) All living organisms are composed of cells and products of cells.
- (ii) All cells arise from pre-existing cells.

12. In proteins, only right handed helices are observed. Other regions of the protein thread are folded into other forms in what is called the secondary structure. In addition, the long protein chain is also folded upon itself like a hollow woollen ball, giving rise to the tertiary structure. This gives us a 3D view of a protein. Tertiary structure is necessary for the many biological activities of proteins.



Cartoon showing : (a) A secondary structure and (b) A tertiary structure of proteins

13. The key features of metaphase are:

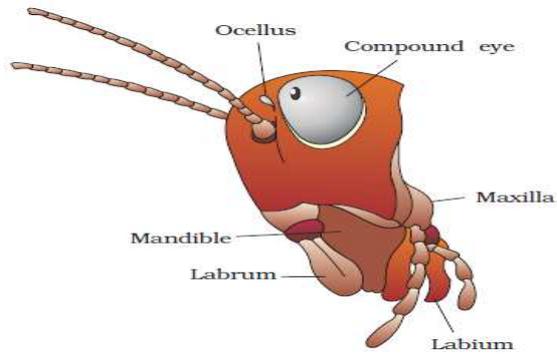
- Spindle fibres attach to kinetochores of chromosomes.
- Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle fibres to both poles.

The completion of prophase can thus be marked by the following characteristic events:

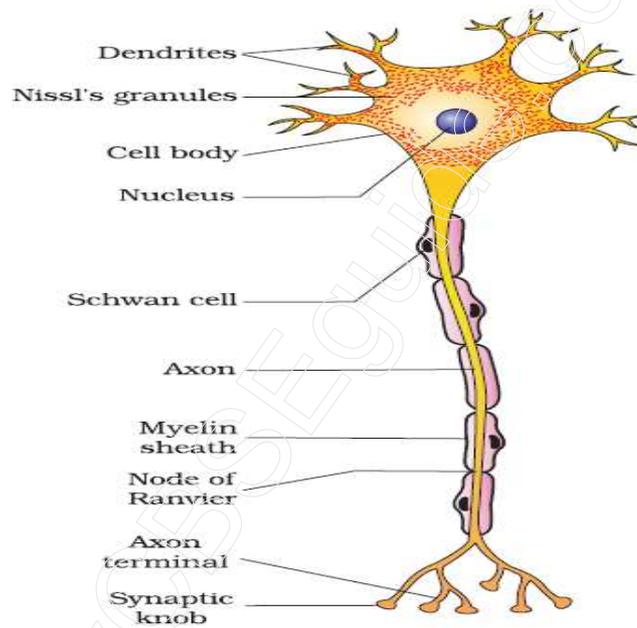
- Chromosomal material condenses to form compact mitotic chromosomes. Chromosomes are seen to be composed of two chromatids attached together at the centromere.
  - Initiation of the assembly of mitotic spindle, the microtubules, the proteinaceous components of the cell cytoplasm help in the process.
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14.



Or



15. The role of haemoglobin in the transport of respiratory gases.

Oxygen is transported as oxyhaemoglobin in the erythrocytes. Oxygen binds to the  $\text{Fe}^{2+}$  part of haem and is carried as oxyhaemoglobin. Each molecule of haemoglobin can transport a maximum of four molecules of oxygen. Carbon dioxide is transported as carbaminohaemoglobin.  $\text{CO}_2$  combines with the amino radical of globin part of haemoglobin. About 23% of  $\text{CO}_2$  is transported in this form.

16. In a resting nerve fibre the axoplasm is electronegative and the exterior is electropositive. This state of the resting membrane is called polarized state. When a

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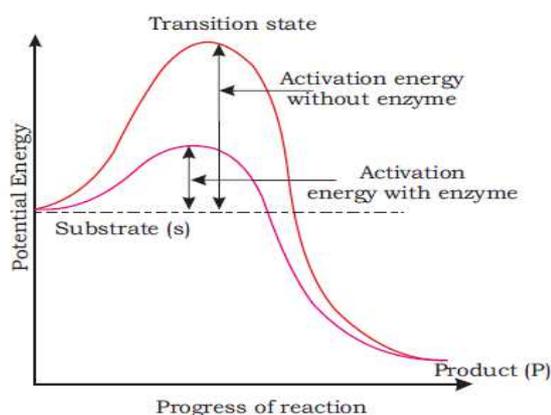
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threshold stimulus is applied, the resting membrane potential undergoes a change to become action potential, where the interior or axoplasm becomes electropositive and the outside is electronegative. Consequent to depolarization, cations diffuse through the cytoplasm from the electropositive depolarized part of the membrane to the electronegative polarized part. This flow of ions depolarizes the next region diffuse through the ECF to the electronegative region on the outer side.

17. Instead of a cell wall, they have a protein rich layer called pellicle which makes their body flexible. They have two flagella, a short and a long one. Though they are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predateding on other smaller organisms. Interestingly, the pigments of euglenoids are identical to those present in higher plants. Example: Euglena.

18. Phloem parenchyma is made up of elongated, tapering cylindrical cells which have dense cytoplasm and nucleus. The cell wall is composed of cellulose and has pits through which plasmodesmatal connections exist between the cells. The phloem parenchyma stores food material and other substances like resins, latex and mucilage. Phloem parenchyma is absent in most of the monocotyledons. Phloem fibres (bast fibres) are made up of Sclerenchymatous cells. These are generally absent in the primary phloem but are found in the secondary phloem. These are much elongated, unbranched and have pointed, needle like apices. The cell wall of phloem fibres is quite thick. At maturity, these fibres lose their protoplasm and become dead. Phloem fibres of jute, flax and hemp are used commercially.

19.

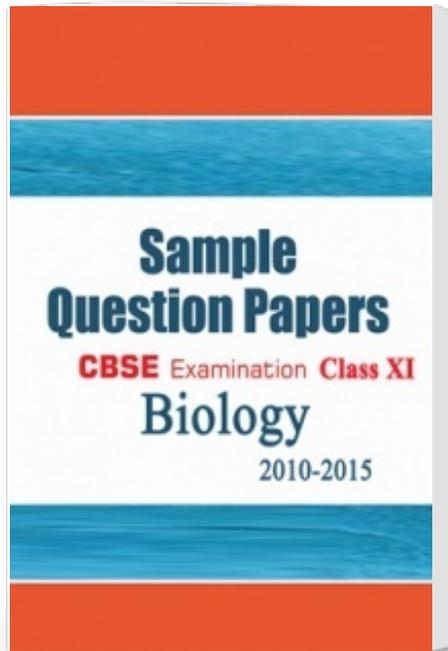


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20. Plant absorbs calcium from the soil in the form of calcium ions ( $\text{Ca}^{2+}$ ). Calcium is required by meristematic and differentiating tissues. During cell division it is used in the synthesis of cell wall, particularly as calcium pectate in the middle lamella. It is also needed during the formation of mitotic spindle. It accumulates in older leaves. It is involved in the normal functioning of the cell membranes. It activates certain enzymes and plays an important role in regulating metabolic activities.
- 21.
- a) Rashmi was a social worker and bounded to her duty about the society.
  - b) The most common method used to determine the sex of undelivered child is ultrasound technique.
  - c) The Determination of sex of Foetus is unlawful practice as this enable the parents to select the sex of the baby that may cause the termination in search of boy.

#### **Section-D**

21. It is a large family, commonly called as the 'potato family'. It is widely distributed in tropics, subtropics and even temperate zones.
- Vegetative Characters: Plants mostly, herbs, shrubs and small trees
- Stem: herbaceous rarely woody, aerial; erect, cylindrical, branched, solid or hollow, hairy or glabrous, underground stem in potato (*Solanum tuberosum*)
- Leaves: alternate, simple, rarely pinnately compound, exstipulate; venation reticulate
- Floral Characters
- Inflorescence: Solitary, axillary or cymose as in *Solanum*
- Flower: bisexual, actinomorphic
- Calyx: sepals five, united, persistent, valvate aestivation
- Corolla: petals five, united; valvate aestivation
- Androecium: stamens five, epipetalous
- Gynoecium: bicarpellary, syncarpous; ovary superior, bilocular, placenta swollen with many ovules
- Fruits: berry or capsule
- Seeds: many, endospermous
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