QUESTION BANK

CLASS XI

SUBJECT : BIOLOGY

Ch-1, The Living World

Q1. What do you understand about biodiversity?

Q2. Define taxonomy and systematics.

Q3. What is binomial nomenclature? Give one example.

Q4. Name the author of the book Systema Naturae. What is this book about?

Q5. What is the taxonomic hierarchy?

Q6. Differentiate between - Taxonomy and Systematics

Q7. Why are viruses considered as a link between living and non-living?

Q8. Explain the hierarchy of biological classification with suitable examples.

Q9. Explain the rules of binomial nomenclature with examples.

Ch-2 Biological Classification

1. Fungi are cosmopolitan, write the role of fungi in your daily life.
2. What is diatomaceous earth?
3. How is the five–kingdom classification advantageous over the two kingdom classification?
4. Polluted water bodies have usually very high abundance of plants like Nostoc and Oscillitoria. Give reasons.
5. Diatoms are also called ‘pearls of ocean’, why?
6. In a stage of their cycle, ascomycetes fungi produce the fruiting bodies like apothecium, perithecium or cleistothecium. How are these three types of fruiting bodies different from each other?
7. What observable features in Trypanosoma would make you classify it under kingdom Protista?
8. Algae are known to reproduce asexually by variety of spores under different environmental conditions. Name these spores and the conditions under which they are produced.

9. Apart from chlorophyll, algae have several other pigments in their chloroplast. What pigments are found in blue-green, red and brown algae that are responsible for their characteristic colours?

10, ‘Peat’ is an important source of domestic fuel in several countries. How is ‘peat’ formed in nature?

11. What is the principle underlying the use of cyanobacteria in agricultural fields for crop improvement?

Ch-3, Plant Kingdom

1 .What is heterospory? Briefly comment on its significance. Give two examples

2.Explain briefly the following terms with suitable examples.

i)Protonema, ii) Anthredium, iii) Sporophyll,

3. Differentiate between the following:
(i) Red algae and brown algae
(ii)Homosporous and heterosporous pteridophytes
(iii)Liverworts and moss

4 .Both gymnosperms and angiosperms bear seeds, so why are they classified separately?

5. Write 5-5 economic importance of algae and gymnosperms each.

6.Mention the ploidy of the following-

protonemal cell of a moss; primary endosperm nucleus in dicot, leaf cell of a moss; prothallus cell of a fern; gemma cell in Marchantia; meristem cell of monocot, ovum of a liverwort, and zygote of a fern.

7. Compare the characteristics of between - Bryophyta and Pteridophyta, Gymnosperm and Angiosperms.

8. What is alternation of generation in plants? Explain with one example.

9. Give reason- Bryophytes are called “amphibians of the plant kingdom”.

10. Draw a labelled diagram of a typical fern plant showing important parts.

CH-4, Animal Kingdom

Q1. What is the importance of coelom in animals?

Q.2.Give examples for the animal having canal system and spicules

Q.3. Give an example of: i) An oviparous mammal ii) Roundworm

iii) A limbless reptile iv) Fish possessing poison sting

Q4. Mention the role of the radula in Molluscs.

Q5. What do you understand about metagenesis? Give an example.

Q6. What is bioluminescence? Give an example.

Q7. How are animals classified on the basis of germ layers? Explain with diagrams.

Q8. Draw a well labelled diagram to show Chordate body plan.

Q9. Define: Bioluminescence, corals, Pseudocoelomate, Radial symmetry, Hermaphrodite and Metamerism.

Q10. Mention location and function of the followings: Nephredia, Radula, Malphighian tubule, Operculam, Air bladder, Tympanum, scutes and Comb plates.

Q11. Differentiate between i) chordates and nonchordates , ii) condrichthyes and oestichthyes.

Ch-5, Morphology Of Flowering Plants

Q1. Define: Inflorescence and explain its types with diagrams.

Q2. Describe a flower and its various parts.

Q3. Describe different types of aestivations in plants with the help of diagrams and examples.

Q4. What do you mean by placentation? Describe different types of placentations in plants with the help of diagrams and examples.

Q5. Draw a well labelled diagram to show V.S. of maize seed and dicot seed.

Q6. Define: A fruit, monoadelphous, epigynous condition, ebracteate, parienth.

Q7. Differentiate between-

a) true and false fruit

b) Actinomorphic and zygomorphic flower

c) Unisexual and bisexual flower

d) Gemosepalous and polysepalous

Q8. Describe the family solanaceae with floral formula, floral diagram, vegetative characters and economic importances.

CH-7, Structural Organisation In Animals

Q1. Give a detailed account of epithelial tissue.

Q2. What are different types of junctions in cells of epithelial tissue?

Q3. Draw a neuron and explain it.

Q4. Differentiate between-

A) Areolar and Adipose connective tissue

B) Tendon and Ligament

C) Bone and Cartilage

D) Skeletal and Cardiac muscles

E) Exocrine and Endocrine glands

Q5. Draw well labelled diagrams showing alimentary canal in frog.

Q6. Differentiate between male & female frogs on the basis of morphological features.

Q7. With the help of labelled diagrams show male & female reproductive systems.

CH-8, CELL: The Unit of Life

1. Differentiate between plant and animal cells
2. Briefly describe the cell theory.
3. Give the biochemical composition of plasma membrane. How are lipid molecules arranged in the membrane?
4. What are plasmids? Describe their role in bacteria?
5. What are histones? What are their functions?
6. Justify the statement, “Mitochondria are the autonomous body.”
7. Give a brief account of cell envelopes in a cell.
8. Write the functions of the following
9. a. Centromere b. Cell wall c. Smooth ER d. Golgi Apparatus
10. What are the different types of plastids? Explain their functions.
11. Discuss briefly the role of nucleolus in the cells actively involved in protein synthesis.
12. How is a prokaryotic cell different from a eukaryotic cell?

13. There are different types of chromosomes based on centromere position. Justify with the help of diagrams.

CH-9, Biomolecules

1. What are biomolecules? Give two examples.
2. What are primary and secondary metabolites? give examples of each.
3. Schematically represent primary, secondary and tertiary structures of a hypothetical polymer, say for example a protein.
4. Nucleic acids exhibit secondary structure, justify with example.
5. Comment on the statement “living state is a non-equilibrium steady- state to be able to perform work”.
6. Formation of enzyme-substrate complex (ES) is the first step in catalysed reactions. Describe the other steps till the formation of the product.
7. What are different classes of enzymes? Explain any two with the type of reaction they catalyse.
8. What is the difference between a nucleotide and nucleoside? Give two examples of each with their structure.
9. What are co-factors? Explain with examples.
10. Glycine and Alanine are different with respect to one substituent on the α -carbon. What are the other common substituent groups?
11. Draw and explain the structure of DNA model as given by Watson & Crick.
12. What is a peptide and glycosidic bond? Show their formation.
13. Give reason: Enzymes are called biocatalysts.

CH-10, Cell Cycle And Cell Division

1. Define mitosis and meiosis.
2. What is the cell cycle? Explain its various stages .
3. Given that the average duplication time of E.coli is 20 minutes, how much time will two E.coli cells take to become 32 cells?
4. A cell has 32 chromosomes. It undergoes mitotic division. What will be the chromosome number (N) during metaphase? What would be the DNA content (C) during anaphase?

5. Mitosis results in producing two cells which are similar to each other. What would be the consequence if each of the following irregularities occur during mitosis?

a. Nuclear membrane fails to disintegrate b. Duplication of DNA does not occur

c. Centromeres do not divide d. Cytokinesis does not occur.

6. Differentiate between Anaphase I and Anaphase II.

7. Comment on the statement – Telophase is the reverse of prophase.

8. What are the various stages of meiotic prophase-I? Enumerate the chromosomal events during each stage?

9.Differentiate between the events of mitosis and meiosis.

10.Write brief note on the following

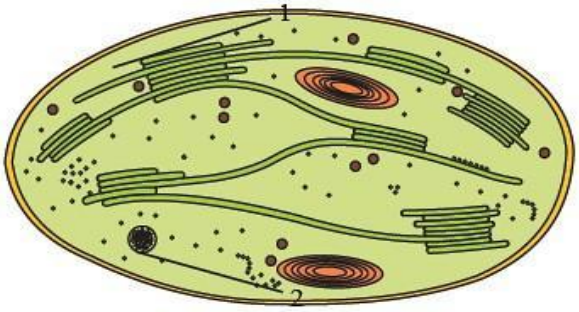
a. Synaptonemal complex b. Metaphase plate

11.Write briefly the significance of mitosis and meiosis in multicellular organism

12. Show various stages involved in meiosis cell division with the help of labelled diagrams.

Ch-11, Photosynthesis In Higher Plants

Q1. Examine the figure and answer the following questions-



a. Is this structure present in animal cells or plant cells?

b. Can these be passed on to the progeny? How?

c. Name the metabolic processes taking place in the places marked (1) and (2).

Q2. $2H_2O$----- $2H^+ + O_2 + 4e^-$
Based on the above equation, answer the following questions:

- a. Where does this reaction take place in plants?
- b. What is the significance of this reaction?

Q3. Cyanobacteria and some other photosynthetic bacteria don't have chloroplasts. How do they conduct photosynthesis?

Q4. a. NADP reductase enzyme located on ?
b. Breakdown of proton gradient leads to release of ?

Q5 $3CO_2$ + 9ATP + 6NADPH + Water glyceraldehyde 3 – phosphate + 9 ADP + 6 NADP+ + 8 Pi
Analyze the above reaction and answer the following questions:

- a. How many molecules of ATP & NADPH are required to fix one molecule of CO2?
- b. Where in the chloroplast does this process occur?

Q6. Explain the followings-

a. Hatch slack pathway b. Calvin cycle

c. PEP carboxylase d. Bundle sheath cells

Q7. Succulents are known to keep their stomata closed during the day to check transpiration. How do they meet their photosynthetic CO_2 requirements?

Q8. Chlorophyll 'a' is the primary pigment for light reaction. What are accessory pigments? What is their role in photosynthesis?

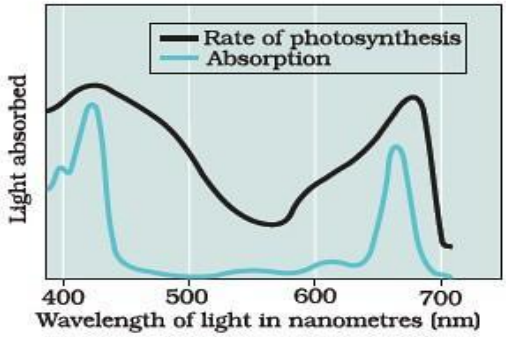
Q9. What conditions enable Rubis CO to function as an oxygenase? Explain the ensuing process.

Q10. Why does the rate of photosynthesis decrease at higher temperatures?

Q11. Explain how during light reaction of photosynthesis, ATP synthesis is a chemiosmotic phenomenon.

Q12. Under what conditions are C4 plants superior to C3?

Q13. In the figure given below, the black line (upper) indicates action spectrum for photosynthesis and the lighter line (lower) indicates the absorption spectrum of chlorophyll a, answer the followings:



- a. What does the action spectrum indicate? How can we plot an action spectrum? Explain with an example.
- b. How can we derive an absorption spectrum for any substance?
- c. If chlorophyll a is responsible for light reaction of photosynthesis, why do the action spectrum and absorption spectrum not overlap?

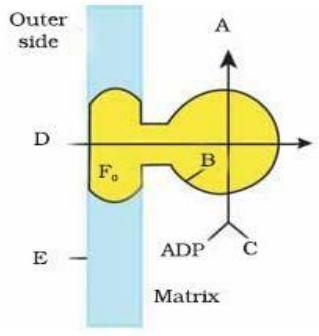
Q14. Why does not photorespiration take place in C4 plants?

Q15. Why is the RuBisCo enzyme more appropriately called RUBP Carboxylase-Oxygenase and what important role does it play in photosynthesis?

CH-12, Respiration In Plants

1. Why is the respiratory pathway referred to as an amphibolic pathway? Explain.
2. Enumerate the assumptions that we undertake in making the respiratory balance sheet. Are these assumptions valid for a living system? Compare fermentation and aerobic respiration in this context.
3. Give an account of Glycolysis. Where does it occur? What are the end products? Trace the fate of these products in both aerobic and anaerobic respiration.
4. The respiratory pathway is believed to be a catabolic pathway. However, the nature of TCA cycle is amphibolic. Explain.

5.Given below is a diagram showing ATP synthesis during aerobic respiration, replace the symbols A, B, C, D and E by appropriate terms given in the box.

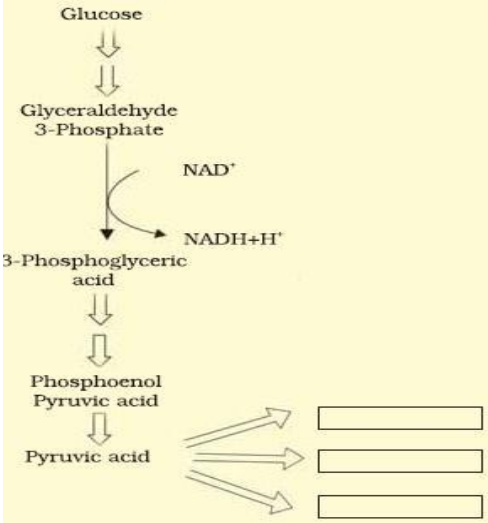


F1, Particle, Pi, $2H^+$, Inner mitochondrial membrane, ATP, Fo particle, ADP

6.Oxygen is critical for aerobic respiration. Explain its role with respect to ETS.

7.Pyruvic acid is the end product of glycolysis. What are the three metabolic fates of pyruvic acid under aerobic and anaerobic conditions? Write in the space provided in

the diagram.



8.When a substrate is being metabolized, why does not all the energy that is produced get released in one step. It is released in multiple steps.What is the advantage of step-wise release?

CH-13, Plant Growth And Development

Q1. Define Plasticity, Photoperiod, Vernalisation, Dedifferentiation,

Q2. Plant growth substances (PGS) have innumerable practical applications. Name the PGS you should use to

- a. Increase yield of sugar cane.
- b. Promote lateral shoot growth.
- c. Cause sprouting of potato tuber.
- d. Inhibit seed germination.

Q3. Light plays an important role in the life of all organisms. Name any three physiological processes in plants which are affected by light.

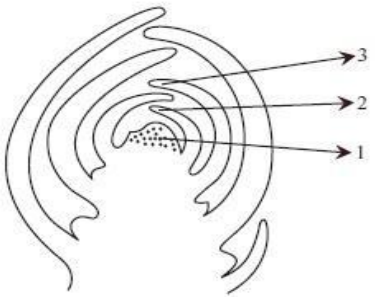
Q4. The role of ethylene and abscisic acid is both positive and negative. Justify the statement.

Q5. Name a hormone which

1. a. is gaseous in nature
2. b. is responsible for phototropism
3. c. induces femaleness in flowers of cucumber

4. d. is used for killing weeds (dicots)
5. e. induces flowering in long day plants

Q6. Label the diagram



- a. This is which part of a dicotyledonous plant?
- b. If we remove part 1 from the plant, what will happen?

Q7. In a slide showing different types of cells can you identify which type of the cell may be meristematic and the one which is incapable of dividing and how?

Q8. Nicotiana tabacum, a Short Day Plant, when exposed to more than a critical period of light fails to flower. Explain.

Q9. What are the structural characteristics of

- a. Meristematic cells near root tip
- b. The cells in the elongation zone of the root

Q10. A primary root grows from 5 cm to 19 cm in a week. Calculate the growth rate and relative growth rate over the period.

Ch-14, Breathing and Exchange of gases

1. Define breathing and respiration. How are they different?

2. What is the role of the diaphragm during inhalation?

3. Name the respiratory pigment in humans and state its function.

4.What is the significance of alveoli in gas exchange?

5.Define tidal volume (TV) and vital capacity (VC).

6. Name any two respiratory disorders and state one symptom of each.

7.How do earthworms respire? Name the respiratory surface involved.

8. Differentiate between:

i. Pulmonary respiration and Tissue respiration

ii. Gills and Lungs (with respect to structure and function)

9. Draw and label a human respiratory system. Mark trachea, bronchi, lungs, and diaphragm.

10. Draw a structure of alveolus showing surrounding capillaries. Explain gas exchange through it

11. Describe the mechanism of breathing in humans. Explain inhalation and exhalation in detail.

12. Explain the transport of oxygen and carbon dioxide in blood. Include the role of haemoglobin.

13. Describe the regulation of respiration in humans. Mention the role of respiratory centres and chemical control.

14. A patient suffers from breathlessness, wheezing, and inflammation of airways, especially during exposure to dust.

Answer the following:
a) Identify the disorder.
b) Which part of the respiratory system is mainly affected?
c) Suggest one preventive measure.

Ch-15, Body Fluids And Circulation

1. What is the difference between blood and lymph?

2. What is meant by double circulation? How is it important for mammals?

3. Write the differences between- Open and Closed system of circulation

ii) Systole and Diastole

iii) P-wave and T-wave

4. The sino-atrial node is called the pacemaker of our heart. Why?

5. What is the significance of atrio-ventricular valves in the functioning of the heart?

6. Define a cardiac cycle and the cardiac output.

7. Explain heart sounds.

8. Draw a standard ECG and explain different segments of it.

9. Explain the causes, symptoms and prevention of the followings-

a) High Blood Pressure b) CAD c) Angina d) Heart Failure

10. What is Rh grouping of blood? Explain the condition of Erythroblastosis foetalis.

11. What are neutrophils and its various types? How do they work differently?

12. Draw and label the structure of the human heart.

Ch-16, Excretory Products And Their Elimination

1. What are different groups of animals based on their excretory products?
2. Define osmoregulation.
3. Draw a human excretory system and label its parts.
4. Explain the following terms: column of Bertini, Cortical and Juxta medullary nephron, micturition, glomerulonephritis, uremia, hemodialysis.
5. Explain the process of urine formation in a nephron.
6. Show a longitudinal section of a human kidney.
7. What is GFR? How is it maintained?
8. How does the counter current mechanism play a role in urine formation? Explain.
9. Lungs, liver and skin also act as excretory organs. Justify
10. What is the condition of renal failure?

Ch-17, Locomotion and Movement

1. Draw the diagram of a sarcomere of skeletal muscle showing different regions.

2. Define sliding filament theory of muscle contraction.

3. Describe the important steps in muscle contraction.

4. Write the difference between:

(a) Actin and Myosin

(b) Red and White muscles

(c) Pectoral and Pelvic girdle

5. What are the different types of movements exhibited by the cells of the body?

6. How do you distinguish between a skeletal muscle and a cardiac muscle?

7. Name the type of joint between the following:-

(a) atlas/axis (b) carpal/metacarpal of thumb

(c) between phalanges (d) femur/acetabulum

(e) between cranial bones (f) between pubic bones in the pelvic girdle

8. Show the structure of contractile proteins.

9. Give a break up of bones present in each part of the human skeleton.

10. What are types of joints? Explain each type with its movement and location.

11.Explain- Myasthenia Gravis, osteoporosis and muscular dystrophy.

12.How is Gout different from Arthritis?

Ch-18: Chemical control and Coordination

1. Define hormones.

2. Name the hormone secreted by the pineal gland.

3. Which endocrine gland is called the “master gland”?

4. Name the hormone responsible for lowering blood glucose level.

5. Which hormone regulates metamorphosis in amphibians?

6. Differentiate between endocrine glands and exocrine glands.

7. Write any four functions of thyroid hormones.

8. Explain the role of parathyroid hormone in calcium balance.

9. Why is the adrenal gland known as a “stress gland”?

10. Describe the functions of insulin and glucagon.

11.Give reason: Iodine deficiency may lead to goitre.

12. Give reason: Excess secretion of growth hormone during childhood causes gigantism.

13. Give reason: Adrenaline is called an emergency hormone.

14. Draw a neat labeled diagram of the human endocrine system.

15. Label the following parts in the diagram of adrenal gland:
Cortex, Medulla, Capsule.

16. A person shows symptoms of increased heartbeat, weight loss, and nervousness.
(a) Which endocrine gland may be overactive?

(b) Name the disorder.
(c) Which hormone is involved?

17. Explain the mechanism of hormone action with a suitable example.

18. Describe the structure and functions of pituitary gland hormones.

19. Explain the functions of hormones secreted by testes and ovaries.

Ch-19, Neural Control and Coordination

1. Define a neuron.

2. Name the insulating layer present around axons.

3. What is a synapse?

4. Name the fluid-filled cavity of the brain.

5. Differentiate between sensory neuron and motor neuron.

6. Explain the structure of a neuron with a neat labeled diagram.

7. What are reflex actions? Give two examples.

8. Describe the functions of cerebrum.

9. Explain the role of neurotransmitters in nerve impulse transmission.

10. Give reason: Reflex actions are very quick responses.

11. Give reason: Myelinated nerve fibres conduct impulses faster.

12. Draw a neat labeled diagram of the human brain.

13. Draw and label the structure of a reflex arc.

14. Choose the correct option.

A student accidentally touches a hot object and immediately withdraws the hand.
(a) Name the type of response shown.
(b) Which part of the nervous system is involved?
(c) Why does the response occur rapidly?

15. Explain the generation and conduction of nerve impulse.