SUBJECT: BIOLOGY

Question Bank for 10+1 and 10+2 students for subject of Biology is hereby given for practice. While preparing the questionnaire emphasis is given on the concepts, short answer type questions in accordance with the syllabus prescribed by Punjab School Education Board so that it can help students from the examination point of view. We hope that you might appreciate this question bank.

Suggestions, constructive criticism of the question bank are always welcome.

With Regards,

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CLASS – XI

SUBJECT – BIOLOGY

UNIT – I

DIVERSITY IN THE LIVING WORLD

Very Short questions carrying one mark :

1. Who proposed the Binomial System of classification?
2. Name the taxon (category) in which related genra are placed.
3. Write the taxonomical categories in hierarchical order.
4. Give biological name for Man and Housefly.
5. Give the full form for ICBN, ICZN.
6. What is a genus?
7. Define taxon.
8. Define Species.
9. Who proposed the five Kingdom system of classification?
10. Name the five Kingdoms as proposed by Whittaker.
11. Expand TMV.
12. What is the common name given to cyanobacteria?
13. Name two bacteria that fix atmospheric nitrogen.
14. Name the Kingdom under which prokaryotes are placed.
15. Give an example of a parasitic flagellated Protozoan.
16. Give an example of an aquatic ciliated Protozoan.
17. How do viroids differ from viruses?
18. Which type of pigment dominates in blue-green alga?
19. Name any siphonaceous alga.
20. Give an example of a plant which produces seed but no fruit.
21. Name the smallest angiospermic plant.
22. What is the genetic constitution of endosperm in angiosperms?
23. Name the Phylum of the animal Kingdom that has cellular level of organization.
24. Name any two Phylums where the animals exhibit radial symmetry.
25. What do we mean by the term coelom.
26. What do we mean by the notochord?
27. Give two examples of phylum-Hemichordata.
28. Define haemocoel.
29. Define metamerism.

UNIT – II

STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS

Very Short questions carrying one mark :

1. What are pneumatophores?
2. Name the different kinds of compound leaves.
3. Name a free floating aquatic plant with photosynthetic roots.
4. Define phyllotaxy.
5. What is phyllode?
6. Name two plants that produce rhizomes.
7. What is the role of lenticels?
8. Name the outer covering of seed.
9. Name the three kinds of meristem.
10. Give the botanical name of Peepal.
11. Define open vascular bundle.
12. What category of a permanent plant cell is companion cell?
13. Name two example of fruit having sclereids.
14. What is the function of companion cell?
15. What type of tissue constitutes calyptrogen?
16. What is other name of cork?
17. What is plastochron?
18. What makes the root's apical meristem subterminal?
19. Write two functions of casparian strips in plant roots?
20. What use are phloem fibres put to?
21. Name the types of agranulocytes?
22. What is haemoglobin?
23. What is diapedesis?
24. Give the example of brush-bordered cuboidal epithelium?
25. What do the fibroblasts synthesize?
26. What does the term amphibian mean?
27. Write down the zoological name of the common Indian frog.

UNIT – III

CELL STRUCTURE AND FUNCTION

Very Short questions carrying one mark :

1. Who coined the term cell?
2. Who proposed the cell theory?
3. Who proposed fluid-mosaic model of plasma-membrane?
4. Name two types of proteins which are present in cell membrane.
5. What is middle lamella?
6. Name two types of endoplasmic reticulum.
7. Define polysome.
8. Name the cell organelle which is called protein factory of the cell.
9. Which cell organelle is called suicidal bag?
10. Who discovered mitochondria?
11. Why are the plastids called kitchens of the cell?
12. Why is nucleus called director of the cell?
13. Give one function of nuclear membrane.
14. Define nucleosome.
15. Name two types of chromatin.
16. Name the cell organelles bounded by single unit membrane.
17. What are dictyosomes?
18. Define tonoplast.
19. Which are building blocks of proteins?
20. List a difference between nucleoside and nucleotide.
21. What are triglycerides?
22. What do you know by amphipathic nature of phospholipids?
23. What do you mean by antiparallel nature of two DNA chains?
24. What are oligosacharides?
25. Name a saturated and an unsaturated fatty acid.
26. What are peptide bonds?
27. Name the sugar present in RNA.
28. Who coined the term enzyme for the first time?
29. Name the nitrogen bases of DNA.
30. Name the sugar present in DNA.
31. Why is mitosis called equational division?

32. Give the site of occurrence of meiosis.
33. What are homologous chromosomes?
34. Define chiasmata.
35. Define karyokinesis.
36. Define crossing over.
37. Give the terms for nuclear division and cytoplasmic division.
38. Who give the term mitosis?
39. Why is meiosis called heterotypical division?
40. Define synapsis.

UNIT – IV
PLANT PHYSIOLOGY

Very Short questions carrying one mark :

1. Why do plants die in water logged soil?
2. What is the process of loss of small quantities of water in droplet forms from tip of some leaves called?
3. Which fraction of soil water is available to plants for absorption by roots?
4. Why is energy required to develop root pressure?
5. Who proposed K^+ exchange hypothesis for the opening and closing of stomata?
6. What are antitranspirants?
7. Name the pink pigment present in the root nodules of a leguminous plant?
8. Name the mineral element which is essential for photo-oxidation of water in photosynthesis.
9. Name one most mobile element and one most immobile element.
10. Which of following is non-symbiotic :
    (a) Azotobacter
    (b) Nostoc
    (c) Rhizobium
    (d) None of these
11. Who discovered that green plants require sunlight for their nutrition?
12. Who demonstrated evolution of oxygen during photo-oxidation of water?
13. Name the reaction centres of PS-**I** and PS-**II**.
14. Write one anatomical feature of C_4 Plants.
15. Which pigment is converted to vitamins A by animals and human beings?

16. What is the first stable product of C_4 cycle?
17. Hill reaction occurs in…….
18. Where are ETS coenzymes located in mitochondria?
19. What is zymosis?
20. Which is the raw material in cell respiration?
21. How many high-energy phosphate molecules are formed from one glucose molecule?
22. Where do most of the Kreb's cycle enzymes occur in mitochondria?
23. Which type of respiration produces water as one of the products?
24. What kind of enzymes are present in mitochondria?
25. Name the enzyme which oxysomes represent.
26. Expand – ABA, NADP.
27. What does an over ripe apple release which affects other apples in the basket.
28. Name the stress hormone in plants that functions during drought.
29. Define growth regulators.
30. What induces parthenocarpy in plants?
31. Define vernalization.
32. Name two synthetic auxins used for inducing the rooting in woody plants.
33. Would a defoliated plant respond to photoperiodic cycle?
34. Define wall pressure.
35. What are hydathodes?
36. What happens to a plant cell when it is placed in a hypotonic solution?
37. Which element is essential part of enzyme urease which catalyzes hydrolysis of urea to Co_2 to NH_4.
38. Who proposed 'Z' scheme and suggested that two photosystems operate in series.
39. Name any two C_4 plants.
40. Name the hormone which increases and decreases the rate of photosynthesis?
41. Which molecules are formed during light reaction?
42. Give single chemical equation of photosynthesis.
43. Why plant cell do not rupture when placed in distilled water?
44. By which process the water reaches the top of a plant?
45. Name the best known symbiotic nitrogen fixing bacterium.
46. What is mineral nutrition?
47. What is hydroponics?

UNIT – V

HUMAN PHYSIOLOGY

Very Short questions carrying one mark :

1. List the main components of food.
2. Name the essential fatty acid.
3. Which is the largest gland in the body?
4. Name the enzyme that curdles milk.
5. Name the hardest substance in the body.
6. Name three types of intestinal movements.
7. What is the role of Vitamin K?
8. What is the role of iron in our body?
9. Which component of bile cause emulsification of fats?
10. What are chemoautotrophs?
11. What is emulsification?
12. What are microvilli?
13. Write the names of respiratory organs present in human beings.
14. Name two animals which carry anaerobic respiration.
15. Define total lung capacity.
16. Give the name of partition between thorax and abdomen.
17. What is the maximum number of O_2 molecules which one molecule of hemoglobin can carry?
18. What do you mean by indirect aerobic respiration?
19. Which is the site of gaseous exchange in insects?
20. Define hypoxia.
21. What is tidal volume?
22. What is fermentation?
23. Which is the sound producing organ in our body?
24. What is Respiratory Quotient (RQ)?
25. What is chloride shift?
26. What is meant by osmoregulation?
27. What is an excretory system meant for?
28. Which is the functional unit of kidney?
29. What is malpighian body?
30. What is micturition?
31. How do lungs help in excretion?

32. What are ammonotelic animals?
33. What is an artificial kidney?
34. What are uricotelic animals?
35. What are ureotelic animals?
36. Name two additional excretory organs in humans.
37. What is the colour of urine due to?
38. What is the role of girdles in skeleton?
39. What is the contractile unit of muscle fibre called?
40. What is the fatigue of muscles due to?
41. By which tissue, muscles are attached to the bones?
42. What is a muscle twitch?
43. Which compounds provide energy for muscle contraction?
44. How many bones form the cranium?
45. How many number of floating ribs present in human skeleton?
46. Name three ear ossicles.
47. What lubricates the freely movable joint at the shoulder?
48. Name two types of myofilaments in a sarcomere.
49. How many bones form the cranium?
50. Name the chemical released by parasympathetic nervous system.
51. Which part of brain controls the heart?
52. What is the nature of nerve impulse?
53. Name the X^{th} cranial nerve.
54. What is a mixed nerve?
55. What is the coloured part of eye called?
56. Which pigment enables us to see in dark?
57. Name two kinds of ciliary muscles.
58. What is the cause of nyctolopia?
59. Name the bones which help in hearing.
60. What is the orgen of corti meant for?
61. Which part of retina has only cones?
62. Give the name of the passage between middle ear and pharynx.
63. Define a harmone.
64. Name the smallest endocrine gland.
65. Name the harmone produced by adrenal gland?
66. What are inhibiting harmones?

67. What is the cause of diabetes mellitus?
68. Name male and female sex harmones.
69. What are releaser harmones?
70. Give the full farm of ACTH and ICSH.
71. Name the disease caused by the deficiency of vasopressin.
72. Name two harmones of pancreatic islets?
73. Why is oxytocin called 'birth harmone'?
74. Name the neuroharmone which inhibits the secretion of growth harmone from the anterior pituitary gland.
75. What is the study of harmones called?
76. Why do we consider blood as connective tissue?
77. What is the size and weight of human heart?
78. Which side of heart contains oxygenated blood?
79. What is the contraction and relaxation of heart called?
80. Why is the S.A. node called pacemaker of heart?
81. Give the term used for rise in RBC count.
82. Explain the term EEG and ECG.
83. What is the heart skeleton composed of?
84. Why is mammalian heart referred as myogenic?
85. Define blood pressure.
86. What are sinusoids? Where are they found?
87. What is meant by double circulation?
88. What is lymph?
89. Which organ receives only oxygenated blood?
90. Antibodies are produced by……
91. At high attitude, whether erythrocytes in a human increase or decrease?

UNIT - I

DIVERSITY IN THE LIVING WORLD

Short questions carrying two mark :

1. Why are living organisms classified?
2. What do we learn from identification of individuals and populations?
3. What is evolutionary classification?
4. What are Lichens and mycorrhiza?

5. Highlight the criteria used for five Kindgom system of classification.
6. Differentiate between gametophyte and sporophyte.
7. Define double fertilization.
8. Enlist the main characters of chlorophyceae.
9. What are the characteristic features of Bryophytes?
10. Enlist the four main characters of Phaeophyceae.
11. What are the fundamental features that form the basis of classification of the animals?
12. Name a jawless vertebrate. Also name the class in which it is included.
13. Name the class of : (a) Cartilagenous fishes, (b) Bony fishes.
14. What are advantages of common names?
15. Write the significance of herbarium.
16. Differentiate between diploblastic and triploblastic animals.
17. What is open and closed circulatory system?
18. Name the excretory organs each of Annelids and Insects.
19. What is circinate ptyxis?
20. Give an example of a plant in which circinate Ptyxis is present.
21. What is metameric segmentation and in which organism is it present?
22. How do protogyny and protandry differ?

UNIT – II
STRUCTURAL ORGANIZATION IN PLANTS AND ANIMALS

Short questions carrying two mark :

1. Distinguish between alternate and whorled Phyllotaxy.
2. Differentiate between root climbers and stem climbers.
3. Mention two types of venation with example.
4. What is imbricate aestivation? Give an example.
5. Potato is a stem and Sweet Potato is a root Justify the statements.
6. What is the difference between simple leaf and compound leaf?
7. What is phyllotaxy? Name three types of phyllotaxy.
8. Give any four examples of secondary meristem.
9. Sieve tubes in angiosperms are associated with specialized parenchyma cells. Name those cells. How do they help sieve tube members.
10. State the difference between functions of collenchyma and parenchyma.
11. Why are mechanical tissues lacking in hydrophytes?
12. Define meristematic tissues. List two characteristics.

13. Name a plant organ where endodermis is absent. Give one basic difference between endodermis and epidermis.
14. Describe sexual dimorphism in cockroach.
15. Discuss the normal and abnormal RBC count.
16. Differentiate between tendon and ligament.
17. How do yellow fat and brown fat differ from each other.
18. Name two fundamental properties of nervous tissue.
19. How do the osteoblasts, osteocytes and osteoclasts differ.
20. What is amplexus? Where is it found?
21. Name the mouth parts of cockroach?

UNIT – III

CELL STRUCTURE AND FUNCTIONS

Short questions carrying two mark :

1. List two main differences between a prokaryotic cell and an eukaryotic cell.
2. Give two differences between SER and RER.
3. Why is ER called cell's circulating system?
4. Differentiate between primary cell wall and secondary cell wall.
5. How do cilia and flagella differ from each other?
6. How do cisternae and tubules of endoplasmic reticulum differ from each other?
7. List the natural sources of sucrose and lactose.
8. Differentiate between apoenzyme and coenzyme.
9. Differentiate between essential and non-essential amino acids.
10. What is significance of meiosis?
11. What is G_1-phase? What changes occur in it?
12. What is interphase? Why was it previously known as resting phase?
13. Why is meiosis essential in sexual reproducing organisms?
14. Define crossing over. Give its significance.
15. Differentiate between chromatin and chromosome.
16. List the functions of rough endoplasmic reticulum.
17. Distinguish between :

    (i) extrinsic and intrinsic proteins (ii) Primary and secondary lysosome.
18. Why is plasma membrane called a semi-permeable membrane? Give its significance.

19. Give the cytological term for :

    (a) Ribosome studded conponents of ER.

    (b) Knob like particles present on inner mitochondrial membrane.

20. Differentiate between euchromatin and heterochromatin.

UNIT – IV
PLANT PHYSIOLOGY

Short questions carrying two mark :

1. What is an isotonic solution and hypertonic solution?
2. Define plasmolysis and deplasmolysis?
3. What forces are involved in the absorption of water from the soil by root hairs?
4. List the mechanisms that contribute to the ascent of sap in tall trees.
5. What is the role of K^+ ions in the opening of Stomata? Explain.
6. Bring out similarity and difference between leghaemoglobin and haemoglobin.
7. Why do plants of legume family contain more protein than other plants?
8. Which are the two macronutrients that usually play the most important role in limiting plant growth globally?
9. How do some bacteria carry out nitrification? What are such bacteria called?
10. A farmer adds Azotobacter culture to the soil before sowing maize. How does it increase the yield of maize.
11. What are accessory pigments? Name them.
12. Explain the compensation point.
13. State Blackman's Law of limiting factor.
14. What do you mean by Kranz anatomy? Give two examples.
15. "Photosynthesis protects us from harmful ultraviolet radiations of sun". Comment on the statement.
16. What is photorespiration? Name the cell organelles involved in photorespiration.
17. Name the hormones which increase and decrease the rate of Photosynthesis?
18. Which enzymes of the citric acid cycle occur in the inner mitochondrial membrane?
19. What is the primary role of cellular respiration?
20. How proton gradient is established?
21. Give resemblances between cellular respiration and burning.
22. For what purpose is the energy from electron transfers used?
23. Define respiratory quotient. Give the RQ for carbohydrates, fats and proteins.
24. What are redox reactions? What is its role in cellular respiration?

25. Would you expect Soyabean plants to flower if given a daily light exposure of 15 hours? Give reason.

26. Which among the following is a long day plant? Sugarbeet, Sugarcane, Tomato. Why is it so called?

27. What is apical dominance? Name the Hormone that controls apical dominance?

28. What is bolting? What conditions can induce bolting naturally.

29. Rubisco is an enzyme that acts both as a carboxylase and oxygenase. Why do you think that Rubisco carries out more carboxylation in C_4 Plants?

30. By looking at a plant externally, can you tell whether a plant is C_3 or C_4? Why and How?

31. Why is abscissic acid known as stress harmone?

UNIT V

HUMAN PHYSIOLOGY

Short questions carrying two mark :

1. How would non-secretion of saliva affects digestion of food in our mouth?

2. Give the cause of dental caries. Write dental formula of a child.

3. Name two proteases of pancreatic juice. What are their specific roles?

4. Explain the coagulation of milk in the alimentary canal.

5. What are microvilli? State their two functions.

6. Name three accessory digestive glands of man.

7. What is peristalsis? How does it help in digestion?

8. Differentiate between chyme and chyle.

9. List the conditions of respiration for the respiratory surface.

10. Why is cutaneous respiration most important mode of respiration in Frog?

11. Tracheae of cockroach are non-collapsible tubes. Why?

12. How does respiration fulfil the energy requirement of an organisms?

13. Name the cartilages that support the larynx.

14. How air is cleaned in the nasal chambers?

15. Write down the route adopted by the foul air, while moving out of the lungs in the atmosphere.

16. What are the heart sounds heard through the stethoscope when placed on the chest? What produces them?

17. What is SA-Node? Where is it located?

18. Explain major features of human lymphatic system.

19. How are ‘Lub’ and ‘Dup’ sounds produced during cardiac cycle?

20. What is pacemaker?
21. What is meant by systole? What happens to mitral valves and related blood flow during ventricular systole?
22. Differentiate between SA-node and AV-node.
23. How does haemoglobin help in transport of oxygen from lungs to tissues?
24. What is portal vein? Give the significance of hepatic portal vein.
25. What are ureotelic animals? Give two examples.
26. What do you mean by ammonotelic and ureotelic animals? Name one organism of each type.
27. What is uricotelism? In what way is it advantageous to the land animals which lay shelled eggs?
28. What is mictuirition? Give normal constituents of human urine.
29. Define ammonotelism. Name the excretory organs of flatworms.
30. Define uricotelism. Name the excretory organs of cockroach.
31. What is the role of calcium ions in muscle contraction?
32. What makes the synovial joint freely movable? List any two types of synovial joints.
33. What is osteoporosis? Name two factors which are responsible for osteoporosis?
34. What causes muscle fatigue? How is it removed?
35. Write four differences between red muscle fibres and white muscles fibres.
36. Write four differences between exoskeleton and endoskeleton.
37. Human has three kinds of ribs. Name these.
38. What is reflex action? What is its significance?
39. Explain two functions of cerebrospinal fluid.
40. What are rod and cone cells?
41. Name two hormones secreted by thyroid gland. Mention one symptom of hypothyroidism in children and name this disorder.
42. What is muscular dystrophy? Write two symptoms of this disease.
43. Name the secretion of alpha and beta cells of islets of langerhans. Mention the role of these secretions.
44. Distinguish between diabetes mellitus and diabetes insipidus.
45. What is cretinism? Give its any two causes.
46. What forms the corpus luteum? Name the hormone secreted by it.

UNIT – I

DIVERSITY IN THE LIVING WORLD

Short questions carrying three marks.

1. Distinguish between cytotaxonomy and chemotaxonomy.
2. Binomial nomenclature is the most acceptable mode of naming organism. Why?
3. What are the advantages of giving scientific names to organisms?
4. Why was Linnaeus system of classification considered an artificial system?
5. Why is it difficult to devise a perfect phylogenetic classification?
6. What are the inadequacies of two Kingdom system of classification?
7. Write the identifying traits of Monera.
8. Write salient features of viruses.
9. Compare the salient features of Monera with Protista.
10. What are the major modes of locomotion found in Protista.
11. Name the alga which is used for obtaining agar. What are the different uses of agar?
12. List common modes of reproduction in algae.
13. Discuss variou types of symmetry found in the animals.
14. Enlist the unique features of phylum Annelida.
15. List six characters of vertebrates.

UNIT – II

STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS

Short questions carrying three marks :

1. Differentiate between Phylloclade and cladode.
2. Give differences between stem and root.
3. Give any three differences between rhizome and bulb.
4. Give three example of false fruits.
5. Differentiate between stolon and sucker.
6. Why are flowers of cucumber referred to as epigynous?
7. Name the major classes of plasma proteins and describe their function.
8. Briefly describe the structure of hyaline cartilage.
9. List the differences between a bone and cartilage.
10. Give the differences between cilia and microvilli.
11. Write a short note on red blood corpuscles.

12. Write a short note on stilt roots with suitable diagram.
13. Define phyllotaxy. Describe its types.
14. Differentiate between prop roots and stilt roots.
15. Differentiate between collenchyma and sclerenchyma.
16. What are conjoint, collateral and open vascular bundles.
17. Draw T.S. dry bone of mammal.
18. Differentiate between medullated nerve fibre and non-medullated nerve fibre.

UNIT – III
CELL STRUCTURE AND FUNCTION

Short questions carrying three marks :

1. State the main function of the following :

   (i) Micochondria, (ii) Golgibodies, (iii) Chloroplasts
2. Write a short note on fluid mosaic model of cell membrane.
3. Write down the main postulates of cell theory.
4. Write a short note on plasmodesmata.
5. Write a short note on chromoplasts.
6. Write a short note on vacuole.
7. Distinguish between monosaccharides and oligosaccharides.
8. Describe the lock and key hypothesis of enzyme action.
9. Differentiate between DNA and RNA.
10. Differentiate between competitive and non-competitive inhibition.
11. Describe the formation of nucleotide.
12. Describe the functions of amino acids.
13. Discuss the formation of fat molecule.
14. Differentiate between essential fatty acids and non-essential fatty acids.
15. Write a short note on structure of tRNA.
16. Write a short note on interphase.
17. Describe pachytene stage of meiosis-I.
18. Differentiate between mitosis & meiosis.

UNIT – IV

PLANT PHYSIOLOGY

Short questions carrying three mark :

1. Differentiate between stomata and hydathode? (Three differences)
2. Explain the following terms :
   (i) Guttation
   (ii) Wilting
   (iii) Imbibition
3. What is meant by apoplast pathway? Why does it occur in cortex and not in endodermis?
4. Why is purification of water and nutrient salts so important in studies involving mineral nutrition used by hydroponics?
5. Name the organism involved in symbiotic nitrogen fixation. What are the components needed for this purpose? Explain their role.
6. What is hydroponics? Give two applications of this technique.
7. "All life on earth is bottled sun energy." Justify.
8. Specify how a pentose phosphate is a Co_2 acceptor in the dark reaction of photosynthesis?
9. Describe the role of P_{700} in cyclic electron transport pathway.
10. Define the following :
    (a) Respiration
    (b) Respiratory substrate
    (c) Respiratory quotient
11. What is shuttle system? Give its role also.
12. What are the advantages of anaerobic respiration in living things?
13. Write the significance of citric acid cycle (or TCA cycle).
14. Explain CO_2 compensation point.
15. What is difference between florigen and other growth hormones?
16. What will you do to prevent leaf fall and fruit drop in plants? Support your answer with reason.
17. Explain inhibitory effect of auxins with help of an example.
18. "Both a short day and long day plant produces flower simultaneously in a given place." Explain.
19. How will you induce lateral branching in a plant which normally does not produce them? Give reason in support of your answer.
20. Describe briefly : (i) Arithmetic growth, (ii) Geometric growth, (iii) Sigmoid growth curve.
21. What is phaeophytin? What is the significance of C_4 cycle?

22. "All elements that are present in a plant need not be essential to its survival". Comment.
23. Why that is in certain plants deficiency symptoms appear first in younger parts of the plant, while in others they do so in mature organs?

UNIT – V

HUMAN PHYSIOLOGY

Short questions carrying three marks :

1. List the biological importance of bile.
2. Describe the structure and functions of stomach.
3. How does butter in your food get digested and absorbed in the body? Explain.
4. Name the hormone that stimulates gall bladder to release the bile juice. How does this juice reach the duodenum? Explain the function of bile in fat digestion.
5. Name one enzyme of gastric juice and one of pancreatic juice that are released as proenzymes in the human alimentary canal. Give the substrate and end product of each.
6. Describe the digestion of carbohydrates in human buccal cavity.
7. Trace the main steps of digestion of proteins as food passes through alimentary canal of man.
8. Describe the pulmonary gas exchange.
9. Define tidal volume, total lung capacity, inspiratory reserve volume.
10. Write the role of diaphragm and intercostal muscles in breathing process.
11. Write six differences between breathing and respiration.
12. Describe, how the respiratory gases are exchanged between the blood and alveolar air?
13. How does hemoglobin help in transport of oxygen from the lungs to body tissues?
14. Explain in brief morphology of human lungs.
15. Write a note on nervous control on respiration?
16. What is heart rhythm? Discuss.
17. What is hypertension? What are its causative factors?
18. What is artificial pacemaker? Explain.
19. Describe the coronary circulation.
20. Describe the process of blood clotting.
21. What is lymph? Describe its circulation in brief.
22. Describe the double circulation in mammals.
23. What is arteriosclerosis? Describe its affects on human health.
24. State the importance of counter-current system in renal functioning.
25. State the normal and abnormal constituents of human urine.
26. Describe how the loop of Henle helps in concentrating the urine in terrestrial mammals.

27. Describe the location of juxta-glomerular apparatus in human Kidney. Explain its function.
28. Briefly explain the principle and function of haemodialysis.
29. Describe the role of skin and liver in excretion.
30. Why are movements and locomotion necessary among the animals?
31. Name the category of bones forming the rib cage? How are these articulated to each other to form the cage.
32. Write down the functions of the various parts of the midbrain and hind brain.
33. Write down the general functions of the nervous system.
34. What is colour vision? Name the cells responsible for it.
35. Describe ear ossicles.
36. Explain the structure of cochlea of internal ear of man.
37. Explain any three functions of cerebrospinal fluid.
38. Name the organ or cells which secrete thyroxin and adrenaline. State their functions.
39. Describe the role of ADH in forming hypertonic urine.
40. What form the corpus luteum? Name two hormones secreted by it.

UNIT – I
DIVERSITY IN THE LIVING WORLD

Long question with five marks :

1. Botanical gardens are living herbaria. Give comments.
2. Binomial nomenclature is the most acceptable mode of naming organism. Why?
3. Give an account of the development of Systematics.
4. Discuss different taxonomic categories.
5. Explain the distinguishing features of kingdom Animalia.
6. What characters of seed plants make them specially adapted to life on land?
7. Describe the similarities and differences in the sexual reproduction of moss and fern.
8. Describe the general characters of seedless vascular plant.
9. Discuss the general characters of class Mammalia.
10. Differentiate the cartilaginous and bony fishes.
11. Give the diagnostic features of Mollusca.
12. Give economic importence of algae.

UNIT – II

STRUCTURAL ORGANIZATION IN PLANTS AND ANIMALS

Long question with five marks :

1. "Flower is a modified shoot", justify the statement.
2. Write an account of various types of fruit?
3. Why there is secondary growth in dicots and no such growth in monocots? Explain.
4. What is collenchyma? Explain its structure and functions in plant body of a herbaceous angiosperms.
5. Give an account of neuron.
6. Enumerate position, structure and functions of aerolar tissue.
7. Describe male reproductive system of cockroach.
8. Define inflorescence. Describe recemose inflorescence and its types.
9. What are underground stems? Describe the various types of underground stems.
10. What is the other name of phloem? Describe the components of phloem.
11. What is the other name of xylem? Describe the components of xylem.
12. With suitable diagram, describe the structure of sarcomere.

UNIT – III

CELL STRUCTURE AND FUNCTION

Long question with five marks :

1. Give an account of structure and functions of cell wall.
2. With suitable diagram, describe the structure of chloroplast.
3. Describe the structure and functions of a mitochondrion.
4. Describe the structure and functions of a nucleus.
5. Enumerate various types of modifications of plasma membrane. Give their significance.
6. Describe polymorphism in lysosomes.
7. Describe the types of proteins on the basis of their shape and chemical nature.
8. Give full form of RNA. Describe the types of RNA.
9. Give full form of DNA. With suitable diagram, explain the structure of Watson & Crick model of DNA.
10. Enumerate the structural models of proteins.
11. Describe the components and formation of nucleotide. Discuss its functions also.
12. (a) Define an enzyme.

    (b) Describe the properties and functions of enzymes.

13. Describe the various factors affecting enzyme activity.
14. Describe lock & key hypothesis for enzyme action with suitable diagram.
15. Discuss Prophase-I of Meiosis-I with the help of well labelled diagrams.
16. Describe briefly the various stages of mitosis with well labelled diagrams.
17. Describe the events taking place during cell cycle.

UNIT - IV
PLANT PHYSIOLOGY

Long question with five marks :

1. Describe the apoplast and symplast pathways.
2. In what way does the concept of water potential help in explaining water movement?
3. How do plants absorb water? Explain the mechanism.
4. Write explanatory notes on biological nitrogen fixation.
5. Make a list of macronutrients and mention their major functions.
6. Describe the process of symbiotic biological nitrogen fixation.
7. Describe the theories related to translocation of water.
8. "Transpiration is a necessary evil." Comment.
9. Describe C_4 cycle in plants for CO_2 fixation.
10. Draw C_3 cycle occurring in plants.
11. Illustrate the mechanism of electron transport system.
12. Explain the process of glycolysis.

UNIT – V
HUMAN PHYSIOLOGY

Long question with five marks :

1. (a) What changes does the food undergo in the stomach?
   (b) Write down four functions of liver.
2. Describe how proteins are digested in the gut of man.
3. Define digestion. Briefly explain the process of digestion in small intestine of man.
4. Describe the mechanism of respiration.
5. Differentiate between :
   (a) SA node and AV node
   (b) Myogenic and neurogenic heart

6. How does blood flow through heart during different phases of cardiac cycle.
7. Describe various corpuscles found in blood of man?
8. Describe conducting system of Human heart.
9. Explain the process of urine formation in a nephron.
10. Describe the role of ADH and liver in excretions.
11. Describe different types of joints. Give example.
12. Explain in detail, how transmission of nerve impulse takes place through a nerve.
13. What is a synapse? How is the nerve impulse transmitted across a chemical synapse?
14. Describe the structure of internal ear. State its functions.
15. Describe the structure and functions of eye.
16. Describe Physiological functions and disorder of thyroid hormone.
17. Define the term hormone. Give an account of the hormones of anterior Pituitary gland.
18. Discuss the role of testes, ovaries and placenta as endocrine glands.
19. Discuss the disorders associated with malfunctioning of adrenal glands.

CLASS – XII
SUBJECT – BIOLOGY

UNIT – I : REPRODUCTION

Very short questions with one mark :

1. Why is reproduction essential for organisms?
2. Why is Amoeba called immortal?
3. Which type of asexual reproduction is found in Hydra?
4. What are gemmules?
5. Define multiple fission.
6. Define grafting.
7. Give two examples of vegetative propagation by roots.
8. Define parthenogenesis.
9. Which is a better mode of reproduction sexual or asexual? Why?
10. Why is the offspring formed by asexual reproduction referred to as clone?
11. Give one example of bird pollinated flower.
12. Give the term for pollination by bats/birds/air/water.
13. What is funiculus?
14. Define geitonogamy.
15. Define palynology.
16. Define allogamy.
17. What is the site of micro sporo genesis?
18. When does a woman attain puberty?
19. What is spermiation?
20. What is the function of scrotal sacs?
21. Name the endocrine cells of testes.
22. Why is urethra of male called urino-genital canal?
23. Name the harmones regulating puberty in male and female.
24. What is corpus luteum? Give its function.
25. Name the aperture of fallopian funnel which receives the ovum released from the ovary.
26. Which part of female genital tract acts as womb?
27. Give function of sertoli cells.
28. Give function of acrosome of sperm.
29. Give the term for periodic vaginal bleeding.
30. Which harmone controls the ovulation?

31. Why is luteal phase also called secretary phase?
32. What is menarche?
33. Why is fertilization also called syngamy?
34. Name the sperm lysins secreted by acrosome of sperm.
35. Define implantation.
36. Give gestation period of human female.
37. What is the function of leydig's cells?
38. Why is cleavage in mammals referred to as simple holoblastic?
39. Give the term for cutting of vas deferens of male and fallopian tube of female.
40. Name any two STD's.
41. Give the term for scientific study of human population.
42. What is carrying capacity?
43. Name technique by which one can detect any possible chromosomal or metabolic disorder in a developing foetus.
44. What is zero population growth?
45. At what stage, is the embryo implanted in the uterus of mother in the case of test tube baby?
46. Give the term for rapid population decline and rapid population growth.
47. What is surrogate mother?
48. What does the sigmoid growth curve show?
49. What are test tube babies?

UNIT – II

GENETICS AND EVOLUTION

Very short questions with one mark :

1. What is meant by heredity?
2. What was the experimental material used by Mendel?
3. Who rediscovered Mendel's Laws of heredity?
4. Define the term allele/Heterozygous/ Homozygous/ Autosomes.
5. Name the process that is antagonistic to linkage.
6. What is the site where two homologous chromosomes cross over?
7. Name two kinds of linkage.
8. What will be the sex of an offspring developing from 44A + XX Zygote?
9. How many contrasting traits Mendel noted in garden pea?
10. What are Mendel's hypothetical factors called in modern terminology?

11. Write the genotypes of man with blood group A & blood group B.
12. How many linkage groups are found in man?
13. Which disorder is caused in man by the presence of one extra sex-chromosome?
14. How many chromosomes a person with Turner's syndrome has?
15. What is an anticodon?
16. Name three non-sense codons.
17. Name the enzyme that joins the short pieces in the 'lagging strand" of DNA during replication.
18. How many bases code for one amino acid?
19. Name the enzymes that can break and reseal the DNA strand.
20. Who proposed the operon model?
21. Who proposed the semi conservative replication of DNA?
22. What are okazaki fragments?
23. What are introns?
24. What was the nature of atmosphere on the primitive earth?
25. Who proposed chemosynthetic theory of origin of life?
26. Name vestigial organs present in man.
27. Which technique is used to know the age of fossils?
28. Which period was dominated by dinosaurs?
29. Who wrote the book 'origin of species'?
30. Which type of locomotion is found in modern man?
31. Which human type is called early true man?
32. Name the galaxy to which our earth belongs.
33. Define Palaeontology.
34. Name the single land mass from which different continents have originated.
35. Which human type was first to use the stones?
36. Which human type is commonly called Cro-Magnon man?
37. Define natural selection.
38. Which organs of man are homologous to the wings of birds?
39. Who proposed the biogenetic theory?
40. Give an example of missing link.
41. Give an example of natural mutation producing a new species.
42. Give 3-word definition of 'organic evolution'.

43. Define recapitulation theory in three words.
44. Name a living fossil.
45. Which is the earliest fossil of prehistoric man?

UNIT – III
BIOLOGY IN HUMAN WELFARE

Very short questions with one mark :

1. Name two sexually transmitted diseases.
2. Which lymphocytes form the humoral immune system?
3. Name the three types of T-lymphocytes.
4. Give full forms of CMIS & AMIS.
5. Which lymphocytes form the cell-mediated immune system?
6. Why are auto immune diseases called degenerative diseases?
7. Which type of immunity is provided by T-lymphocytes?
8. Why is SCID called primary immune deficiency?
9. Why is AIDS called secondary immune-deficiency?
10. What are carcinogens?
11. Give the term for the spread of cancer from one part to other parts of body.
12. Name two toxic chemicals present in tobacco.
13. Name two opiates.
14. Give the source of caffeine.
15. What are hallucinogens?
16. Which type of drugs act as mood elevators?
17. What are pyrogens?
18. What are interferons?
19. Which antimicrobial enzyme is present in tears and saliva?
20. Name any stimulant.
21. Give the term for the rearing of honey bee for increased product of honey and bee wax.
22. Name the most suitable species of honey bee for apiculture.
23. Name two high milk-yielding cross breeds of cows.
24. Name two exotic breeds of cows.
25. Name the branch of Biology dealing with all the aspects of domesticated animals.
26. Define biofortification.
27. Give examples of two micro-organisms working for SCP.

28. What is emasculation?
29. Name the microbe involved in the preparation of bread.
30. Name two household products produced by microbes.
31. Which microbes are employed to produce biogas?
32. Give two examples of bio control agents.
33. What are biofertilizers?
34. Name two symbiotic N_2 fixing microbes.
35. Name the first organic acid produced by microbial fermentation.
36. Name two vitamins produced by microbial fermentation.
37. Which symbiotic N_2 fixing Cyanobacterium lives in association with Azolla?
38. Which bacterium contains insecticidal crystal protein thurioside?
39. Name the sources of biofertilizers.
40. What are baculoviruses?

UNIT – IV
BIOTECHNOLOGY AND ITS APPLICATIONS

Very short questions with one mark :

1. What are molecular scissors?
2. What are plasmids?
3. What do you mean by Ori?
4. What are pallindromes?
5. What is DNA probe?
6. Name the enzyme commonly used to dissolve cell wall.
7. What is recombinant DNA?
8. Which bacteria are commonly employed as vector in plant genetic engineering?
9. Give an example of transgenic bacteria.
10. Name the bacterium from which 'Bt' toxin is produced.
11. What is gene therapy?
12. What are transgenic animals?
13. Name genetically engineered human insulin.
14. Name some transgenic crops.
15. What is microinjection?
16. How many amino acids are present in insulin?
17. What are hybridomas?

18. Name the scientists who generated first recombinant DNA molecule.
19. What is the main function of bioreactors?

UNIT – V
ECOLOGY AND ENVIRONMENT

Questions with one marks :

1. Define ecological niche.
2. What is zero population growth?
3. Give the term for the number of organism per unit area.
4. Define natality rate.
5. Give the term for the number of deaths per 1000 individuals of a population in a year under the existing conditions.
6. Give the term for the graph showing the pattern of growth of a population.
7. Which day is celebrated as World Population Day?
8. Name two types of growth curves.
9. What are adaptations?
10. Give the term for the scientific study of human population.
11. Give the term for a series of trophic levels showing repeated eating.
12. Give the term for the network of interconnected food chains.
13. Who proposed the ecological pyramids?
14. Who proposed 10% law?
15. What is pioneer community?
16. Give the term for last and stable community of sere.
17. Who gave the term ecosystem?
18. Name the process by which CO_2 enters into living world.
19. Name the term used for evolution of biotic communities on a bare area.
20. What is net primary productivity?
21. Give full form of IUCN.
22. Define cryopreservation.
23. What is Red Data Book?
24. Name the first national park established in India.
25. What is meant by specific diversity?
26. Name photochemical oxidants which pollute air.
27. Which pollutants are contributed by aeroplanes?
28. What do you mean by biological magnification?

29. Name the pollutants present in acid rain.
30. Which toxic gas was responsible for Bhopal gas tragedy?
31. Name the disease associated with Cadmium Pollution.
32. Which disease is associated with the eating of mercury contaminated fish?
33. Give the term for the loss of useful components of soil.
34. What is the main cause of soil erosion in India?
35. What is desertification?
36. What are aerosols?
37. Which heavy element was responsible for minamata disease?
38. Give two examples of ozone depleting substances.
39. What are secondary pollutants?
40. What is blue baby syndrome?

UNIT – I
REPRODUCTION

Short questions with two marks :

1. Why is vegetative reproduction practised for growing some types of plants?
2. Define budding. Differentiate between exogenous and endogenous budding.
3. What are gemmules? Give their functions.
4. Both meiosis and fertilization are essential to maintain chromosome number constant Why?
5. Why amoeba is called immortal?
6. Draw a labelled sketch of mature pollen grain.
7. Why is fertilization of angiosperms called double fertilization?
8. How does endosperm of angiosperms become triploid?
9. What is need and significance of pollination in plants?
10. Define triple fusion? What is the product of this process?
11. Is it possible for plants to produce seeds without fruits? Give reasons.
12. How many cells and nuclei are there in a typical angiosperm embryo sac? Write the functions of synergid?
13. What is puberty? When it is attained?
14. What are Leydig's cells? Give its function.
15. At what stage, corpus luteum is formed? Name two harmones secreted by it.
16. Give four characteristics of cleavage.
17. Give the functions of placenta.

18. Differentiate between graafian follicle and corpus luteum.
19. Differentiate between morula and blastula of a human being.
20. Differentiate between menarche and menopause.
21. In our society, the women are often blamed for giving birth to daughters. Can you explain why this is not correct?
22. How is polyspermy prevented in humans?
23. Give four functions of placenta.
24. List the ill effects of over population.
25. What is amniocentesis? Give its significance.
26. Name two STD's and give their causal organisms.
27. Describe chemical methods of birth control.
28. What is reproductively healthy society? List two measures to develop such a society.
29. Write a note on medical termination of pregnancy (MTP).
30. Write a short note on test tube babies.

UNIT – II

GENETICS AND EVOLUTION

Short questions carrying two marks :

1. Give significance of variation.
2. Which disorder is caused due to presence of extra autosome and one less sex chromosome?
3. Why the human male can't pass the gene for colourblindness to his sons?
4. Why Mendel selected pea plant for his experiments?
5. Differentiate between leading and lagging strand.
6. Define replication. What is semi conservative mode of replication?
7. Define linkage. Name two types of linkage.
8. How is sex determined in human beings?
9. Why Mendel missed linkage?
10. Define synapsis and chiasmata.
11. If the sequence of one strand of DNA is written as :

    5' ATG CATGCA TGCATG 3, Write down the sequence of complementary strand in 5'$\rightarrow$3' direction.
12. Give the site and time of occurrence of transcription.
13. Where and when does replication occur?
14. What do you understand by central dogma?

15. Describe one example of adaptive radiation.
16. Can we call human evolution as adaptive radiation?
17. What are coacervates? List its life like properties.
18. Name the gases present in primary atmosphere of primitive earth. What were the natural sources of energy?
19. What do you mean by 'Ontogeny repeats phylogeny'?
20. How did DDT become ineffective against mosquitoes?
21. Differentiate between natural selection and artificial selection.
22. Differentiate between Java ape men and Peking man.
23. What were the gases used in Miller and Urey's experiment and what were the end products of their experiments?
24. Differentiate between connecting link and missing link.
25. What is struggle for existence? Give its significance.

UNIT – III

BIOLOGY AND HUMAN WELFARE

Short questions carrying two marks :

1. Differentiate between innate and acquired immunity.
2. Differentiate between active and passive immunity.
3. Differentiate between antigen and antibody.
4. How do humoral and cell-mediated immune systems differ from each other?
5. Why is using tobacco in any form injurious to health?
6. Give reason why alcohol is a depressant?
7. Give reason why phagocyte cells such as neutrophils and macrophages are called soldiers and scavengers of the animal body.
8. From which plant opium is obtained? Name any derivative of opium.
9. Write major differences between benign tumour and malignant tumour.
10. Differentiate between carcinomas and sarcomas.
11. Define alcoholism. List the reasons of alcoholism.
12. Describe the ill effects of alcohol on liver.
13. Define autoimmune diseases. Give two examples.
14. Name at least four danger signals of cancer.
15. What is apiculture? How is it important in our lives?
16. What is heterosis? What role has it played in crop productivity?

17. What is selection? Name two methods of selection.
18. List the features in wild plants selected by man for his own benefits.
19. What is the importance of biofortification?
20. What do you mean by totipotency of a cell? Name the scientist who coined the term.
21. What are somatic hybrids? How are they produced?
22. What is the function of aeration tank in the treatment of sewage.
23. Name water fern that is an excellent biofertilizer for rice cultivation. What helps the fern to do so?
24. What are antibiotics? Name any two micro-organisms used in the production of antibiotics.
25. What is the role of methanogenic bacteria in production of biogas?
26. In which food, would you find lactic acid bacteria? Mention some of their useful applications.
27. How does Rhizobium promote the yield of a legume?
28. Why is the cattle dung used to produce the biogas?
29. In which way microbes have played a major role in controlling disease caused by harmful bacteria?
30. Why are biogas plants mainly located in rural areas?

UNIT – IV
BIOTECHNOLOGY AND ITS APPLICATIONS

Short questions carrying two marks :

1. Distinguish between micro-infection and electroporation.
2. Differentiate between blunt ends and sticky ends.
3. Differentiate between endonuclease and exonuclease.
4. What are DNA ligases? Write two uses of gene cloning.
5. Write two uses of PCR.
6. List any four advantages of genetically modified crop plants over their mild domesticated relatives.
7. What essential features must be present in cloning vehicle?
8. Write a short note on human insulin.
9. Write short note on biopiracy.

UNIT – V

ECOLOGY AND ENVIRONMENT

Short questions carrying two marks :

1. What is carrying capacity? Mention two causes for rapid growth of human population.
2. Write a short note on mutualism/ predation/ parasitism.
3. Give reason why scavengers are essential in biotic communities.
4. Differentiate between natality rate and mortality rate.
5. Differentiate between grazing food chain and detritus food chains.
6. Differentiate between food chain & food web.
7. Define ecological pyramids. Name different types of ecological pyramids.
8. What do you mean by conservation of wildlife? What are two objectives of conservation of wildlife?
9. What are the ill effects of benzpyreme? Mention its sources also.
10. What is acid rain?
11. What is green house effect? Give its ill effect.
12. List four ill effects of radioactive pollution.
13. What is photochemical smog? How does smog affect us?
14. List the causes which lead to global warming.
15. What are greenhouse gases? Name two gases exerting greenhouse effect.
16. Differentiate between biodegradable and non-biodegradable pollutants.
17. A food chain has only a few trophic levels Comment.
18. Differentiate between autotrophs and heterotrophs.
19. Differentiate between net primary productivity and gross primary productivity.
20. What is particulate matter? How do particulate matters harm human health?

UNIT – I

REPRODUCTION

Short questions carrying three marks :

1. Write six characters of insect pollinated/ bird pollinated/ wind pollinated flowers.
2. Describe the structure of pollen grain and the process of germination.
3. Draw well labelled diagram of L.S. of anatropous ovule.
4. Describe three types of endosperm briefly.
5. Trace the development of a mature ovule from a megaspore mother cell.
6. What are major functions of male accessory ducts and glands?

7. Draw a labelled diagram of a graafian follicle.
8. Write about the functions of : (i) Endometrium, (ii) Acrosome, (iii) Corpus luteum.
9. What is menstrual cycle? Which harmones regulate menstrual cycle?
10. How do Leydig cells help in spermatogenesis?
11. What is cleavage? Where does it occur in the human female? What does it lead to?
12. Draw a labelled diagram of the microscopic structure of a human sperm.
13. Describe the structure of a seminiferous tubule.
14. Describe the formation of morula larva.
15. What are STD's? Name some STD's? How can they be prevented?
16. Name a pre-natal diagnostic technique. List the steps involved in carrying out this technique.
17. Define infertility. List some causes of infertility. Name some assisted reproductive technologies to check the problem of infertility.
18. Write briefly about the surgical methods of birth control.
19. What is meant by reproductive health? List some measures implemented by the Government of India to achieve it.
20. Describe chemical methods of birth control.

UNIT – II

GENETICS AND EVOLUTION

Short questions carrying three marks :

1. Taking example of ABO blood types of human, explain the phenomenon of multiple alleles and co-dominance.
2. A haemophilic son is born to a normal couple. Explain the mechanism of inheritance. What is the probability of a haemophilic daughter being born to this couple?
3. Write a short account of the chromosome theory of inheritance.
4. Write a short note on incomplete dominance
5. Give reasons for Mendel's success.
6. Define linkage. Name two types of linkage and explain them.
7. Define crossing over. Describe factors affecting crossing over.
8. Write a short note on turner's Syndrome.
9. Write a short note on structure of t RNA.
10. Explain Meselson and stahl's experiment for semi-conservative replication of DNA.
11. What are essential requirements of the genetic material?
12. Give the salient features of human genome project.
13. Why are DNA and ribosomes located at different sites?

14. Describe an inducible operon.
15. What is DNA finger printing? Write the applications of it.
16. Distinguish between DNA and RNA.
17. Write six characters of genetic code.
18. Define homologous organs. Explain it with an example in case of animals.
19. Define a connecting link. Explain it with an example.
20. Explain recapitulation theory.
21. Explain Stanley and Miller's experiment for organic synthesis.
22. Huxley described birds as glorified reptiles. Explain.
23. Write a short note on industrial melanism.
24. How do new species arise according to De-vries mutation theory of organic evolution?
25. Differentiate between connecting link and missing link giving atleast two examples of each.
26. How the reducing atmosphere of primitive earth helped in origin of life.
27. Discuss the homology in the chromosomes of man and ape.
28. Why is Cro-Magnon man called the extinct representative of modern man. Explain.
29. Differentiate between Java ape men and Peking men.
30. Differentiate between Darwinism and Neo-Darwinism.

UNIT – III
BIOLOGY IN HUMAN WELFARE

Short questions carrying three marks :

1. Describe the types of T-lymphocytes.
2. Discuss the cause and symptoms of asthma.
3. Describe passive immunity. Give its significance and drawbacks.
4. What is addiction? Give the source of tobacco. List the ill effects of nicotine.
5. Define opioids. Give their source and effects.
6. What are carcinogens? Name two carcinogens. Explain the term malignancy.
7. Describe the ill effects of alcohol on stomach and liver.
8. Differentiate between B-Cells & T-Cells.
9. Explain in briefly the role of animal husbandry in human welfare.
10. Write a short note on single cell protein.
11. Explain the secondary treatment of sewage.
12. What are biofertilizers? Discuss the role of symbiotic N_2 fixation by a bacterium and a Cyanobacterium.

13. Discuss the role of various fungi in the fermentation processes to produce household products.
14. Write a brief account of dairy farm management.
15. Write a short note on role of microbes in preparation of curd.

UNIT – IV

BIOTECHNOLOGY AND ITS APPLICATIONS

Short questions carrying three marks :

1. What are restriction enzymes and why are they so important in recombinant DNA technology?
2. What are essential features of a vector?
3. Differentiate between plasmid DNA and chromosomal DNA.
4. What essential features must be present in a cloning vehicle?
5. What are molecular scissors? Describe their role in recombinant DNA technology?
6. Describe various types of enzymes needed for recombinant DNA technology.
7. Describe in brief the features required to facilitate cloning into a vector.
8. Write a short note on electroporation.
9. What is down stream processing? What are its advantages in obtaining the commercial products?
10. Write the functioning of the most commonly used bioreactor in order to obtain the foreign gene product.
11. How do the improvement of crop plants through genetic engineering more advantageous than conventional breeding?
12. How are transgenic animals helpful to us?
13. Write a note on Bt cotton.
14. Write a short note on biopatent.
15. Write a brief account of methodology of gene therapy.
16. Expand PCR. Explain the mechanism of PCR.

UNIT – V

ECOLOGY AND ENVIRONMENT

Short questions carrying three marks :

1. Explain any three population characteristics.
2. List adaptations for temperature variations in animals.
3. Describe plant adaptations to aquatic environments.

4. Write a short note on competition citing an example.
5. Write a short note on parasitism.
6. Define food web. Write characteristics of a food web.
7. Write a short note on pyramid of biomass.
8. Define ecological succession. Differentiate between primary succession and secondary succession.
9. Give an account of energy flow in an ecosystem.
10. What is primary productivity? Explain the difference between net primary productivity and gross primary productivity.
11. Discuss causes and effects of global warming.
12. What is acid rain? What are its effects on plants?
13. Define biomagnification. Discuss ill effects of biomagnification.
14. What are ill effects of water pollution?
15. Describe the components of biodiversity.
16. Describe the causes of extinction of biodiversity.
17. How do national parks and sanctuaries differ?
18. What are specific objectives of conservation of wild life?
19. Describe three benefits of biodiversity.
20. Write a note on management of wild life.

UNIT – I
REPRODUCTION

Long questions carrying five marks :

1. Describe the various modes of asexual reproduction in the living organisms.
2. Describe the development of female gametophyte with suitable diagrams.
3. What is double fertilization? Describe the process giving significance. Add a note on post fertilization changes leading to formation of seed.
4. Draw diagrammatic sketch of the sectional view of a typical orthotropic ovule. List the components of the embryo-sac and mention their fate in fertilization.
5. Describe the development of a dicot/ monocot embryo with suitable diagrams.
6. Write a note on the development of endosperm. Mention the types with examples.
7. Explain structure and function of testes of human male.
8. Describe the female reproductive organs of humans.
9. Where does oogenesis take place? Describe the process of oogenesis.
10. Give an account of spermatogenesis in human male.
11. Describe the structure of human spermatozoan with a well labelled diagram.

12. Show diagrammatically the stages of embryonic development from zygote upto implantation.
13. Describe the hormonal control of menstrual cycle in human female.
14. Define reproductive health. Enlist the problems associated with the reproductive health. What strategies have been adopted to achieve a reproductively healthy society?
15. Enumerate various types of birth control measures.
16. Explain various special techniques which can be used in assisted reproductive technologies.
17. What is birth control? Explain various temporary methods of birth control.

UNIT – II

GENETICS AND EVOLUTION

Long questions carrying five marks :

1. State and explain Mendel's law of segregation.
2. State and explain Mendel's law of independent assortment.
3. With a suitable example, explain pleiotrophy. Which of the genes studied by Mendel in pea is now considered to be pleiotropic?
4. Describe the nature of inheritance of ABO type of blood groups in humans.
5. Define crossing over. Explain the mechanism of crossing over with suitable diagrams.
6. Genetic material is DNA and not protein. How did Griffith prove this? Explain.
7. With suitable diagrams, explain the process of DNA replication.
8. Briefly describe the steps involved in the process of translation.
9. Describe the process of transcription of RNA from DNA.
10. How did Hershey & Chase prove that DNA is a genetic material?
11. Explain with the help of schematic representation the lac operon of E-coli. Mention also the role of Lactose in this Operon.
12. Describe briefly the origin of life by chemosynthetic theory of Oparin and Haldane.
13. Describe paleontological evidences which support the idea of organic evolution.
14. Describe the postulates of Darwinism.
15. Give a brief evolution of horse .
16. Explain de-vries mutation theory of evolution.
17. Explain the chronology of various human types.
18. Describe various evidences supporting common ancestary of men and apes.
19. Define Hardy - Weinberg equilibrium Principle. Explain in brief the factors affecting Hardy - Weinberg equilibrium.
20. Describe embryological evidences which support the idea of organic evolution.

UNIT – V

ECOLOGY AND ENVIRONMENT

Long questions carrying five marks :

1. How do plants adapt to water scarcity and saline environments?
2. Briefly explain plant adaptations to aquatic environment.
3. Describe the S-shaped growth curve. How is it different from the J-shaped growth curve?
4. Name different types of adaptations in animals. Explain desert adaptations.
5. Describe the carbon cycle in nature.
6. Explain the concept of food chain. Describe the two types of food chain.
7. Explain in brief the various components of ecosystem.
8. Describe the process of succession on a bare rock.
9. How does succession differ in terrestrial and aquatic ecosystems? Give salient points.
10. What are ecological pyramids? Explain pyramid of energy and pyramid of biomass.
11. Describe the ill effects of air pollution on plants and human beings.
12. Describe the various sources of air pollution.
13. Describe various sources of water pollution.
14. Describe (a) thermal pollution (b) Radioactive waste disposal.
15. Describe the strategies for the solid waste management.
16. Describe in detail the benefits of biodiversity.
17. Discuss the various factors which lead to the extinction of biodiversity.
18. Discuss factors which affect the population density of an area.
19. What are the different adaptations in animals? Explain desert adaptations in animals,
20. Discuss adaptations of plants to water scaracity and heat.
21. Discuss adaptations of plants to aquatic environments.
22. Write shorts notes on : (i) Predation, (ii) Mutualism.
23. With a particular example, explain about energy flow in ecosystem.
24. Depict diagrammatically a food web in an ecosystem. How many types of food chains are there in this food web?
25. (a) Define ecosystem.
    (b) Describe structural characteristics of an ecosystem.
    (c) Discuss abiotic components of an ecosystem.
26. (a) Define food chain.
    (b) Explain detritus food chain giving an example.

27. (a) Define ecological succession.

    (b) Explain about the stages in hydrosere.

28. What kind of threats to biodiversity may lead to loss? Explain.

29. Write an explanatory note on the efforts for conservation of biodiversity in India.

30. Write about major atmospheric pollutants and their sources.

31. Write explanatory notes on :

    (i) Effect of Radioactive pollution on human beings.

    (ii) Biochemical oxygen demand.

32. Explain control measures used for controlling soil pollution?

33. Describe the ill effects of water pollution.

34. Account for the causes of smog, acid rain and green house effect. How do they affect us?

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