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**SYLLABUS 2016-2017****MONTH-WISE SYLLABUS****First Semester (April -August 2016)**

APRIL 2016

**Chapter 1:** THE LIVING WORLD**Chapter 2:** BIOLOGICAL CLASSIFICATION

MAY 2016

**Chapter. 3:** PLANT KINGDOM

JULY 2016

**Chapter 4:** ANIMAL KINGDOM**Chapter 5:** MORPHOLOGY OF FLOWERING PLANTS**Chapter 6:** ANATOMY OF FLOWERING PLANTS

AUGUST 2016

**Chapter 7:** STRUCTURAL ORGANISATION IN ANIMALS**Chapter 8:** CELL: THE UNIT OF LIFE**Second Semester (September-November 2016)**

SEPTEMBER 2016

**Chapter 9:** BIOMOLECULES**Chapter 10:** CELL CYCLE AND CELL DIVISION

OCTOBER 2016

**Chapter 11:** TRANSPORT IN PLANTS**Chapter 12:** MINERAL NUTRITION**Chapter 14:** RESPIRATION IN PLANTS

NOVEMBER 2016

**Chapter 13:** PHOTOSYNTHESIS IN HIGHER PLANTS**Chapter 15:** PLANT GROWTH AND DEVELOPMENT**Chapter 16:** DIGESTION AND ABSORPTION

DECEMBER 2016

**Chapter 17:** BREATHING AND EXCHANGE OF GASES**Chapter 18:** BODY FLUIDS AND CIRCULATION**Chapter 19:** EXCRETORY PRODUCTS AND THEIR ELIMINATION

JANUARY 2017

**Chapter 20:** LOCOMOTION AND MOVEMENT**Chapter 21:** NEURAL CONTROL AND COORDINATION**Chapter 22:** CHEMICAL COORDINATION AND INTEGRATION

February 2017 REVISION

SYLLABUS 2015-2016  
UNIT – WISE WEIGHTAGE  
THEORY

TIME : 3 HOURS

MARKS: 70

UNIT	NAME	MARKS
I	DIVERSITY IN THE LIVING WORLD	07
II	STRUCTURAL ORGANISATION IN ANIMALS AND PLANTS	12
III	CELL : STRUCTURE AND FUNCTION	10
IV	PLANT PHYSIOLOGY	13
V	HUMAN PHYSIOLOGY	18
	TOTAL	60

**The Biology final examination paper would contain Open Text Book Assessment (OTBA) for 10 marks.**

**PRACTICALS**

TIME : 3 HOURS

MARKS: 30

	CONTENTS	MARKS
1	EXPERIMENTS AND SPOTTING	20
2	RECORD OF ONE INVESTIGATORY PROJECT AND VIVA BASED ON THE PROJECT	5
3	CLASS RECORD AND VIVA BASED ON EXPERIMENTS	5

**Chapter No. 1**  
**THE LIVING WORLD**

1. A crystal increases in size and so does a baby. What is the difference?
2. Differentiate between catabolism and anabolism with examples.
3. Enlist the rules for writing scientific names. Give an example.
4. Define classification, taxonomy and systematics.
5. Show the hierarchical arrangement of taxonomic categories.



**Chapter No. 2**  
**BIOLOGICAL CLASSIFICATION**

**1 mark each**

1. Fill in the blanks:

- i) Two or more species occupying the same or overlapping area are \_\_\_\_\_.
- ii) The microscopic unicellular organisms found in aquatic bodies are \_\_\_\_\_.
- iii) In Monera the DNA is \_\_\_\_\_ and \_\_\_\_\_ histones.
- iv) Most common method of reproduction in prokaryotes is \_\_\_\_\_.
- v) Phylogeny refers to \_\_\_\_\_.
- vi) In the 5 kingdom classification, unicellular eukaryotes, primarily aquatic and both autotrophic and heterotrophic are included under \_\_\_\_\_.
- vii) Slime moulds resemble \_\_\_\_\_ but are put under kingdom \_\_\_\_\_.
- viii) The body of fungi is called \_\_\_\_\_ and is made of \_\_\_\_\_.
- ix) Binomial nomenclature was first described by \_\_\_\_\_ and consists of 2 words \_\_\_\_\_ and \_\_\_\_\_.
- x) In artificial system of classification organisms are classified on the basis of \_\_\_\_\_.
- xi) Dinoflagellates belong to kingdom \_\_\_\_\_. Their mode of reproduction is \_\_\_\_\_.
- xii) Asexual spores produced at the tip of hyphae exogenously are called \_\_\_\_\_.
- xiii) A fungus where sexual reproduction is not known is \_\_\_\_\_.

2) What kind of nutrition does (i) Monera, (ii) Protista, (iii) Fungi show?

3) What is the basis of classification of protozoa?

4) What are Mycorrhiza?

5) What is red tide?

6) What kind of food is stored in Fungi?

7) Give the technical name for the fruiting body of a mushroom.

8) In which cells of *Nostoc*, does nitrogen fixation take place?

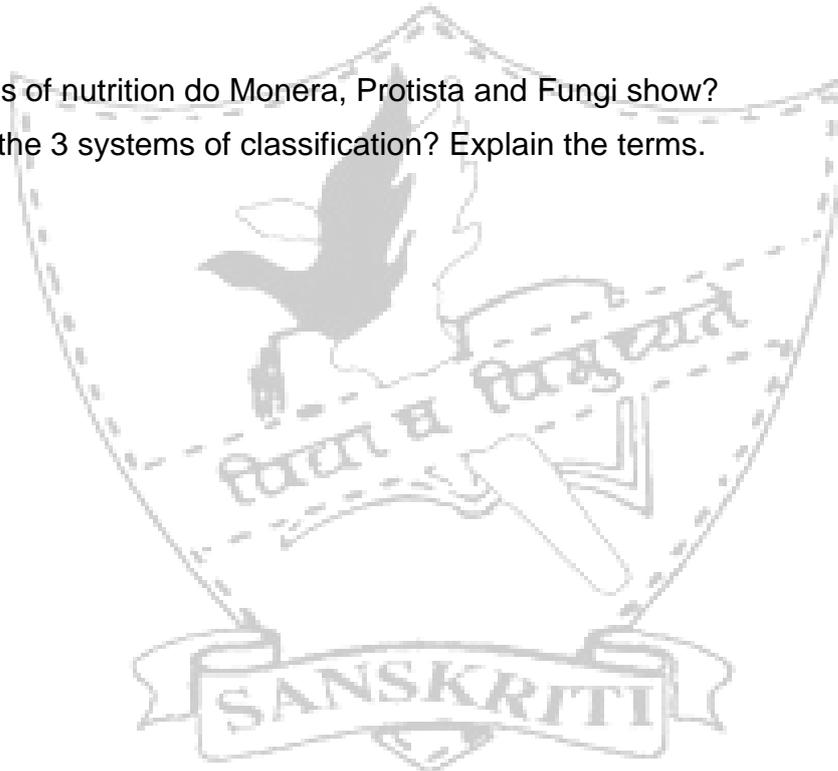
- 9) Why are blue green algae included under Monera?  
10) In the scientific name *Ficus bengalensis* L, what does 'L' stand for?

**2 marks each**

- 1) Describe the phylogenetic system of classification How is it different from the artificial system?
- 2) State the importance of mycorrhiza.
- 3) What are the advantages of 3 Domain classification?

**3 marks each**

- 1) What kinds of nutrition do Monera, Protista and Fungi show?
- 2) What are the 3 systems of classification? Explain the terms.



**Chapter No. 3**  
**PLANT KINGDOM**

**1 mark each**

1) Fill in the blanks:

- i) Dominant generation in Bryophytes is \_\_\_\_\_ and gametes are produced by \_\_\_\_\_ meiosis occurs in \_\_\_\_\_.
- ii) Spore of a fern belongs to \_\_\_\_\_ generation.
- iii) After a forest fire ferns are often the first plants to reappear because \_\_\_\_\_.
- iv) Gametophytic phase of *Pinus* is restricted to \_\_\_\_\_ and \_\_\_\_\_.
- v) Agar is obtained from \_\_\_\_\_.

2) Name the amphibians of the plant kingdom. Why are they called so? Which group do kelps belong to? Give 1 reason why bryophytes cannot grow taller than a few inches?

**2 marks each**

- i. What does the prothallus look like? What is its significance?
- ii. What kind of photosynthetic pigment is found in red algae, brown algae?
- iii. Distinguish between the gametophyte of a moss and a fern.
- iv. Where does meiosis occur in bryophytes and pteridophytes?
- v. An organism is aquatic, mainly marine with a filamentous form. Their cell wall is covered with algin. Identify the organism. State any 1 economic use of such organisms.

Vi Where will you find the following:

Fucoxanthin, siliceous wall, uncovered seeds, sori, rhizoids.

**Chapter No. 4**  
**ANIMAL KINGDOM**

**1 mark each**

- 1) Why do Platyhelminthes need a flat body?
- 2) Why is octopus included under Mollusca?
- 3) Name the phylum where you will find (i) tube feet, (ii) calcareous shell

**2 marks each**

- 1) What kind of polymorphism do cnidarians show?
- 2) How have reptiles coped with the dry terrestrial habitat?
- 3) Platypus is an oviparous animal. Justify its classification under Mammalia

**3 marks each**

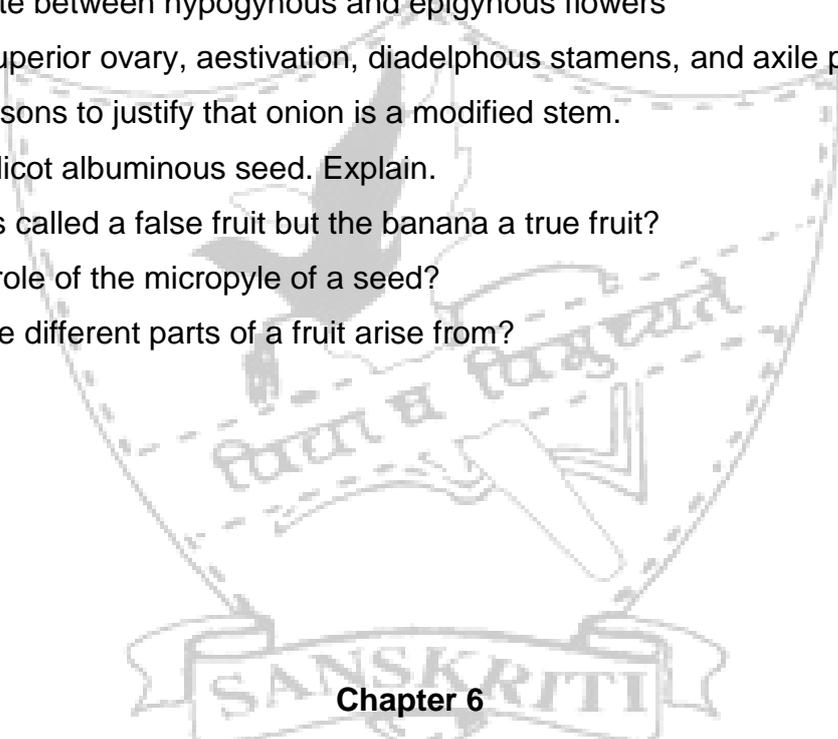
1. Define the term 'coelom.' Enlist 3 features that enable the avian organisms to fly giving 2 examples of the group.  
Write an explanatory note on  
(a) Tube within a tube plan,  
(b) Cell aggregate plan,  
(c) Blind sac plan.
2. Differentiate between Chondrichthyes and Osteichthyes.
3. With which animal/ phylum would you associate the following?  
Carapace, malpighian tubules, medusa, mantle, flame cells, ossein, hinged calcareous shell.
4. Give scientific terms for the following  
Excretory organs of annelids,  
Stinging organs of jelly fish,  
Free floating forms of cnidaria,  
Collection of nerve bodies,  
Protein found in the skeleton of sharks,  
Blood filled cavity of arthropods.

**Chapter 5****MORPHOLOGY OF FLOWERING PLANTS****1 marks each**

1. Name 2 plants that produce rhizomes.  
Give 2 examples where root system is poorly developed.
2. What are haustoria? Name a plant which has them.
3. What is the difference between tendrils of pumpkin and pea?

**2 marks each**

- 1) Differentiate between hypogynous and epigynous flowers
- 2) Explain: superior ovary, aestivation, diadelphous stamens, and axile placentation.
- 3) Give 2 reasons to justify that onion is a modified stem.
2. Castor is a dicot albuminous seed. Explain.
3. Why apple is called a false fruit but the banana a true fruit?
4. What is the role of the micropyle of a seed?
5. Where do the different parts of a fruit arise from?



**Chapter 6**  
**ANATOMY OF FLOWERING PLANTS**

**1 mark each**

- 1) Where is the quiescent center located? Why is it named so?
- 2) What is endarch arrangement? Where will you find it?
- 3) If xylem is called wood, what is phloem called?

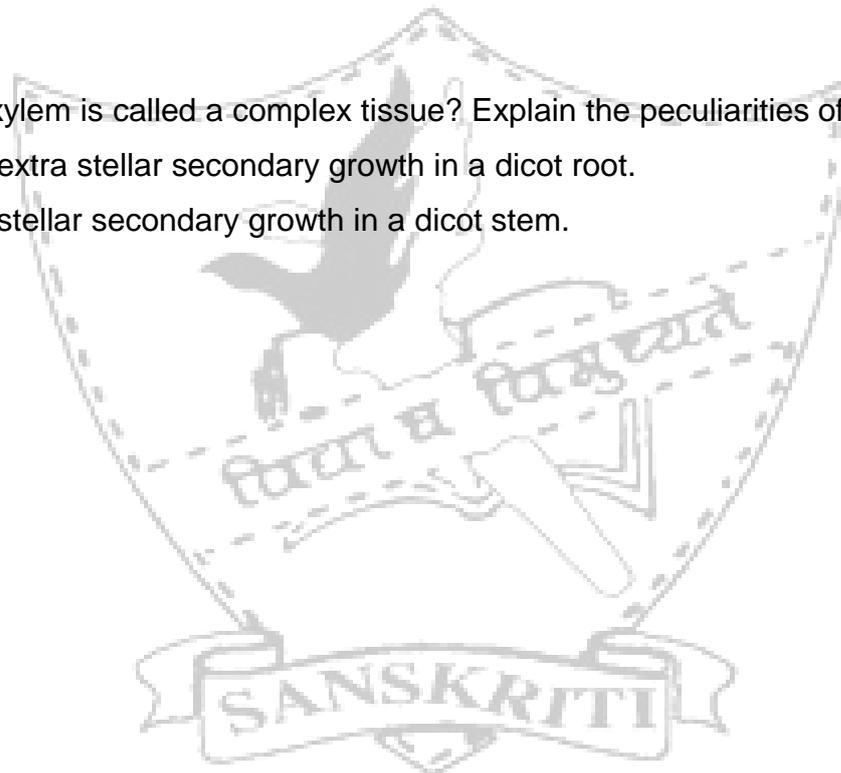
**2 marks each**

- 1) If you get a 4 cm piece of flowering plant, how will you identify anatomically if it is a stem or a root?

- 2) Why annual rings are better developed in hilly areas than in coastal areas?
- 3) Mention 2 differences between stems of sunflower and maize.
- 4) With reference to a dicot root, answer the following questions:
  - a) Where is the pericycle located?
  - b) How are the xylem vessels arranged?
  - c) What types of cells constitute the cortex?
  - d) What does the pith look like?
- 5) What is another name given to cork cambium? What kind of cells does it give rise to?
- 6) Name the dead elements of the xylem and the phloem.

**3 marks each**

- 1) Why the xylem is called a complex tissue? Explain the peculiarities of the tissue.
- 2) Describe extra stellar secondary growth in a dicot root.
- 3) Describe stellar secondary growth in a dicot stem.



## Chapter 7

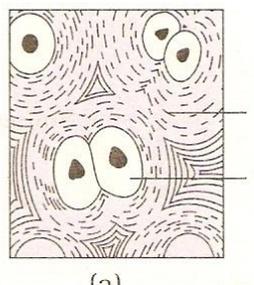
## STRUCTURAL ORGANISATION IN ANIMALS

## 1 mark each

- 1) What do fibroblasts synthesize?
- 2) What are chondrocytes?
- 3) Name the protein found in bone and cartilage.
- 4) Name the most common ion found in blood.
- 5) Where will you find chondrin? Describe the tissue where these proteins are found.
- 6) How is a ligament different from a tendon?
- 7) How do epithelial tissues get their supply of nutrients?
- 8) Where are blood cells produced?

## 2 marks each

- 1) Enlist the basic characteristics of epithelium and connective tissues.
- 2) Where will you find ciliated epithelium and why?
- 3) State the difference between keratinized and nonkeratinised epithelium. Where are each of them found?
- 4) Name the kind of cells found in connective tissue. State the function of each.
  - (a) Identify the diagram
  - (b) Label the diagram
  - (c) Where will you find this structure in the body?



## 3 marks each

- 1) Name the tissue that lines urinary bladder, intestinal mucosa, fallopian tubes. State the importance of the presence of these tissues in these locations.
- 2) Where will you find the following in the body:  
Ciliated epithelium, myosin, lacunae, lamellae, ossein, axons

**Chapter 8**  
**CELL: THE UNIT OF LIFE**

**1 mark each**

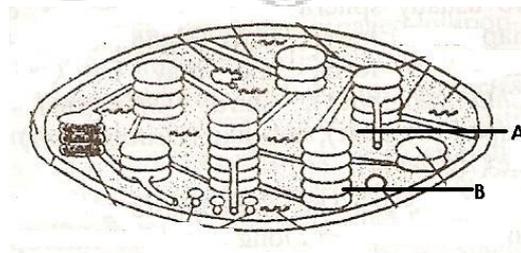
- 1) Name the substance that stabilizes the cell membrane of a eukaryotic cell.
- 2) What kinds of ribosome are found in a prokaryotic cell?
- 3) Name the substance that stabilizes the cell membrane of a prokaryotic cell.

**2 marks each**

- 1) Why are lysosomes called suicidal vacuoles? What kind of enzymes do they have?
- 2) Describe the genetic organization of a bacterial cell.
- 3) How is a Eukaryotic cell wall different from a prokaryotic cell wall?
- 4) Describe the function of any membrane bound cell organelle.

**3 marks each**

- 1) How does the fluid mosaic model of a cell membrane explain the following:
  - (a) facilitated transport
  - (b) Tissue recognition
  - (c) endocytosis
  - (d) antigenic properties of a tissue
  - (e) active transport
- 2) What is euchromatin? Explain the structure of a eukaryotic nucleus



Identify the picture shown above.

Label A and B

Give the function of each

**5 marks each**

- 1) Describe along with labeled illustrations, the Singer Nicholson Model of the cell membrane.

**Chapter 9**  
**BIOMOLECULES****1 mark each**

- 1) Name the homopolysaccharide found in an animal cell.
- 2) What are nucleosides?
- 3) Name 2 essential fatty acids.
- 4) What do you mean by anti parallel nature of DNA?
- 5) What kinds of bonds are found in a starch molecule?

**2 marks each**

- 1) Why does oedema occur in persons suffering from deficiency of protein?
- 2) Name 2 coenzymes derived from vitamins?
- 3) Name 2 non-iron products of the breakdown of hemoglobin.
- 4) Differentiate between coenzyme and cofactor. Describe any 3 factors that affect enzyme activity
- 5) With the help of illustrations describe the secondary structure of proteins.
- 6) What is  $K_m$ ? What is its significance?

**3 marks each**

- 1) Illustrate a glycosidic, a peptide, and a phosphodiester bond.
- 2) With the help of illustrations explain the concept of feedback inhibition of enzymes.
- 3) Enlist 3 factors that affect enzyme activity. Describe how they change enzyme function.
- 4) Why are phospholipids called amphipathic? State the significance of such molecules with respect to bio membranes. State any 1 role of the proteins found in association with bio membranes.
- 5) How are enzymes classified? How do they act as biocatalysts?

**5 marks each**

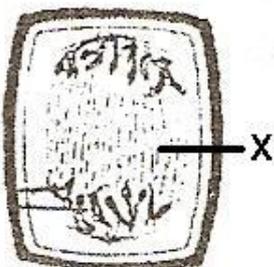
- 1) What is a polysaccharide? Describe the levels of organization of protein structure.  
What is a glycosidic bond? Draw a diagram to show the formation of this bond.

**Chapter 10****CELL CYCLE AND CELL DIVISION****1 mark each**

1. In which phase does DNA replication take place?
2. In which phase of cell division are the chromosomes present in the cytoplasm?
3. At which phase do you see sister chromatids during mitosis and meiosis?

**2 marks each**

1. Enumerate the events that occur during diakinesis. What is the significance of crossing over?
2. What are the events that occur during (a) G<sub>2</sub> phase, (b) S phase.
3. Does interphase take place after meiosis I? Justify.
4. Differentiate between mitotic and meiotic anaphase .

**3 marks each**

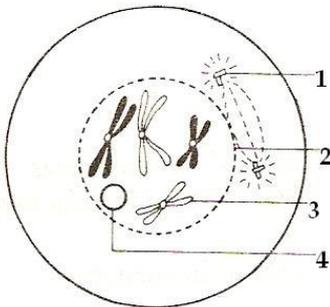
- i. Identify the stage shown in the diagram above.
- ii. How will (X) form in this kind of a cell?
- iii. How will this stage be different from a similar stage in Meiosis I?
- iv. What is the chemical composition of (A)?

- v. Describe briefly, the stage immediately preceding this stage.

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- 2) Why is the interphase called a period of great activity? State the significance of meiosis.
- 3) Examine the figure and answer the questions:

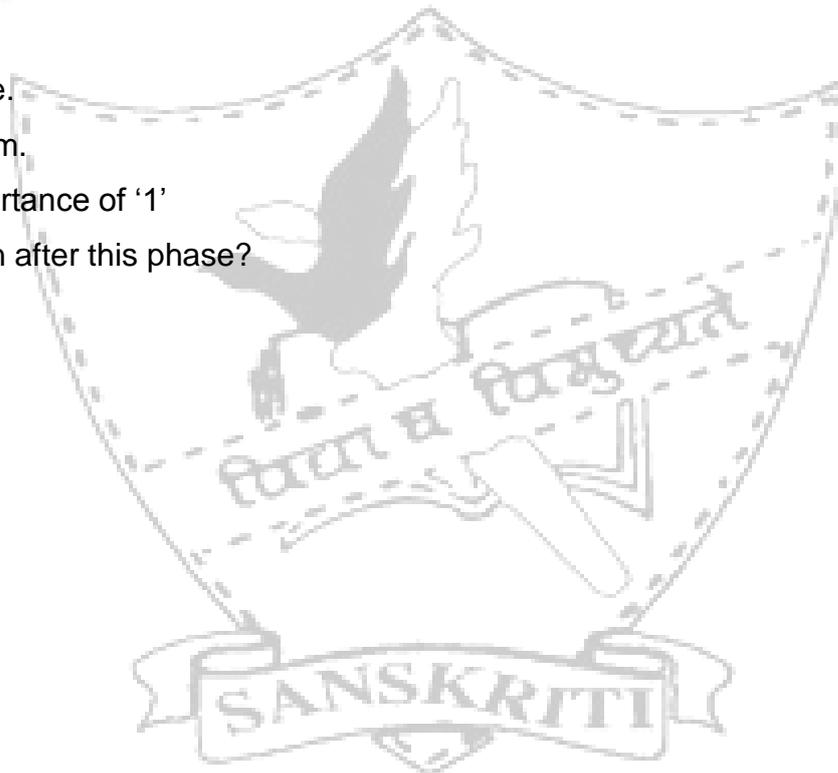


Identify the stage.

Label the diagram.

What is the importance of '1'?

What will happen after this phase?



**Chapter 11**  
**TRANSPORT IN PLANTS**

**1 mark each**

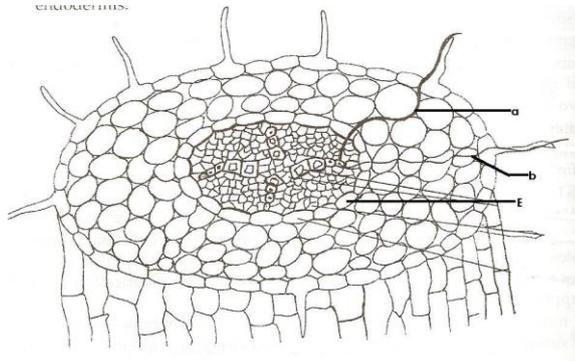
- i) What happens to the plant cell if it is placed in higher water potential?
- ii) A plant cell when kept in a certain solution got plasmolysed. What was the nature of the solution?
- iii) What does capillarity in the xylem depend on?
- iv) What do you understand by the chemical potential of a solute?
- v) What does the water potential of a solution depend on?
- vi) What are the conditions necessary for imbibition to take place?
- vii) What is the peculiarity of the endodermis that it prevents apoplastic pathway of water?

**2 marks each**

- i) Describe the significance of  $\Psi$ s with reference to  $\Psi_w$ .
- ii) What kind of movement drives water through the cortex of the root?
- iii) How does the casparian strip affect water movement?
- iv) Under what conditions will water enter a cell?
- v) What is reverse osmosis? What is its application?
- vi) Name a hormone that acts as an anti transpirant. How does it function?
- vii) Why does an increase in internal CO<sub>2</sub> concentration close stomata?
- viii) How does humidity and temperature affect transpiration?
- ix) How is water transported to leaves in trees that are more than 100 m tall?

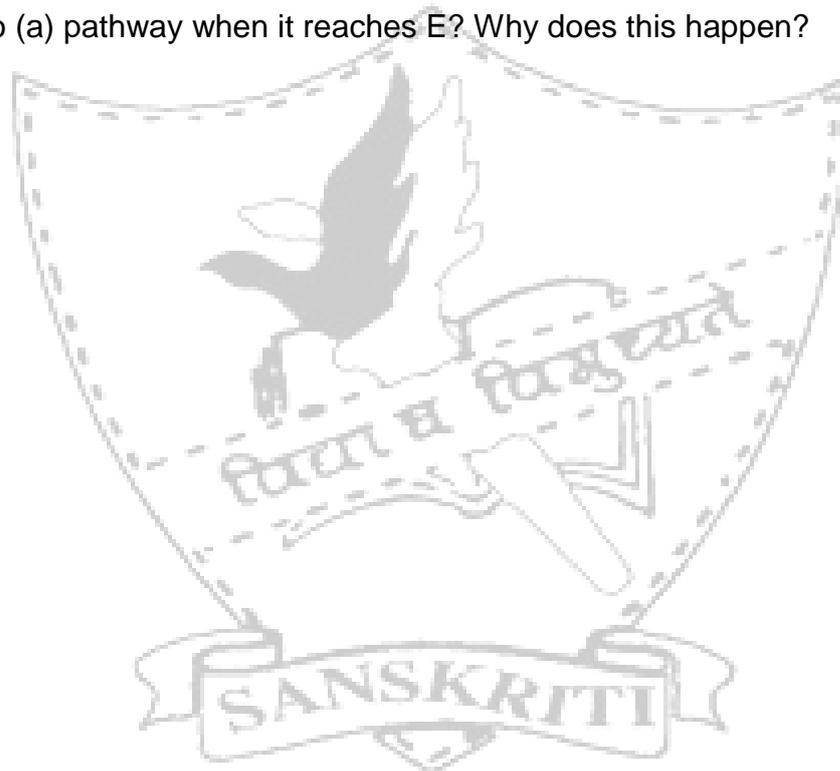
**3 marks each**

Explain the mechanism of opening and closing of stomata.



Label the pathway (a) and (b), shown in the above diagram?

What happens to (a) pathway when it reaches E? Why does this happen?

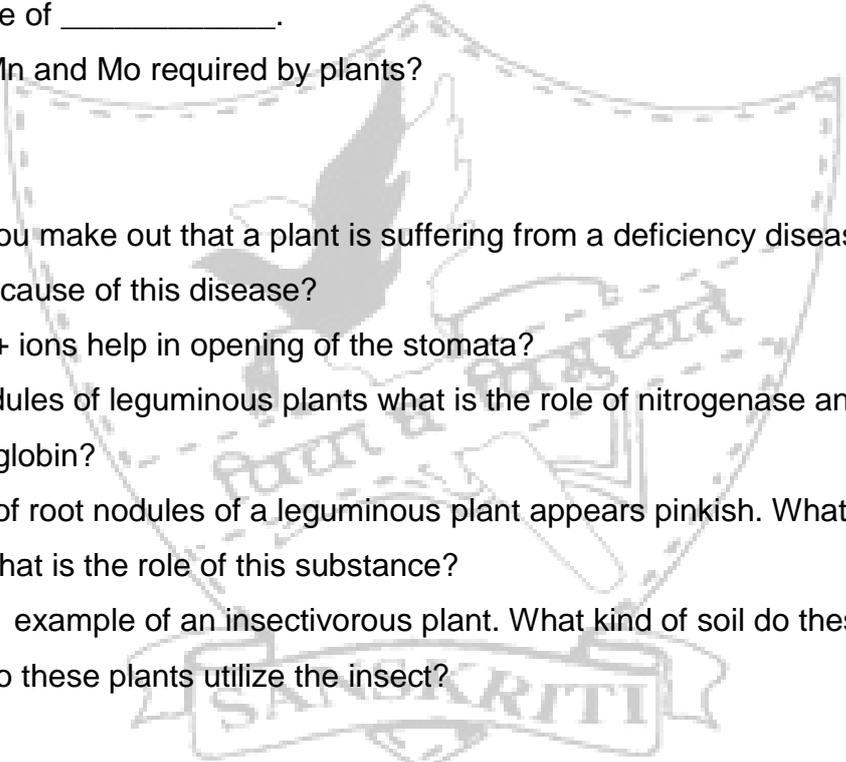


**Chapter 12**  
**MINERAL NUTRITION**

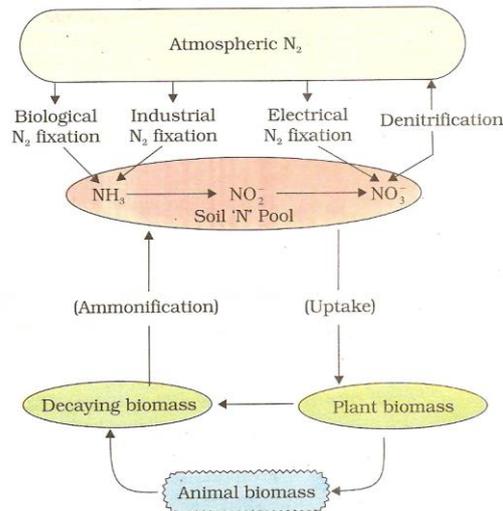
**1 mark each**

- i) A healthy potted *Nepenthes* when kept in a green house with favorable condition of light, temperature, and soil water, showed poor growth. Though there was no infection. State the possible cause of this problem.
- ii) How will you determined the essentiality of a mineral?
- iii) Leaf color of *Nepenthes* is \_\_\_\_\_.
- iv) Some of its leaves in insectivorous plants are modified to \_\_\_\_\_ for the purpose of \_\_\_\_\_.
- v) Why are Mn and Mo required by plants?

**2 marks each**

- i) How will you make out that a plant is suffering from a deficiency disease? How will you find a cause of this disease?
  - ii) How do  $K^+$  ions help in opening of the stomata?
  - iii) In root nodules of leguminous plants what is the role of nitrogenase and leghaemoglobin?
  - iv) A section of root nodules of a leguminous plant appears pinkish. What is the color due to? What is the role of this substance?
  - v) Give any 1 example of an insectivorous plant. What kind of soil do these plants grow in? How do these plants utilize the insect?
- 

3 mark each.



- 1) Explain the diagram shown above. Name all the organisms involved at each step.
- 2) Give an account of Biological Nitrogen fixation.

## Chapter 12 PHOTOSYNTHESIS IN HIGHER PLANTS

1 mark each

1. A potted plant kept in sunlight is shifted to monochromatic red light. How will this affect the rate of photosynthesis?
2. What is the difference between chlorophyll a and chlorophyll b?
3. How many molecules of ATP are required for the synthesis of glucose in the C<sub>3</sub>, C<sub>4</sub> cycle?
4. Fill in the blanks:
  - a. Enzyme that accepts O<sub>2</sub> during photorespiration \_\_\_\_\_
  - b. Chlorophyll of mesophyll cells of C<sub>4</sub> plants have a high concentration of \_\_\_\_\_ enzyme.
  - c. Calvin cycle takes place in \_\_\_\_\_.
  - d. Noncyclic photophosphorylation needs a constant supply of \_\_\_\_\_.
  - e. First electron donor in cyclic photophosphorylation is \_\_\_\_\_.
  - f. First acceptor of CO<sub>2</sub> in C<sub>3</sub> cycle is \_\_\_\_\_.

- g. First acceptor of CO<sub>2</sub> in C<sub>4</sub> cycle is \_\_\_\_\_.
  - h. First product formed in C<sub>4</sub> cycle is \_\_\_\_\_.
  - i. First product formed in C<sub>3</sub> cycle is \_\_\_\_\_.
  - j. Pigments of PSI occur in the \_\_\_\_\_ part of the chloroplasts.
5. Define chemosynthesis. Name a bacteria that is chemosynthetic
6. What is PAR? Give its importance.
7. Mention the conditions under which PSI of the light reaction works.

**2 mark each.**

1. The photosynthetic lamellae are taken out from a chloroplast and suspended in nutrient medium in presence of light and CO<sub>2</sub>. Will they synthesize glucose? Justify.
2. 2 green potted plants were kept inside bell jars. One was kept in sunlight while the other kept in the dark. Which will survive longer? Explain.
3. Why do plants need to reduce photorespiration?
4. Expand PGA, PSI, P700, and Rubisco.
5. State the advantages of having more than 1 pigment molecule in the photo Centre.
6. Why is photorespiration considered to be a wasteful process as well as a threat?
7. Give any 1 example of an insectivorous plant. What kind of soil do these plants grow in? How do these plants utilize the insect?
8. Mention any 2 functions of carotenoids.

**3 marks each**

1. What is the significance of photolysis of water in photophosphorylation? What happens to each product of this process?
2. Name the 3 cellular organelles involved in photorespiration. Mentioned the various steps of this pathway.
3. Name the enzyme that catalyzes carboxylation and oxygenation. In which cell organelle is this enzyme found?
4. Describe Kranz anatomy. State its importance.
5. Rubisco acts as an oxygenase as well as carboxylase. Explain both the reactions. Under what conditions does this shift from one role to the other occur?
6. Explain the process by which *Rhizobium* bacteria infect roots of leguminous plants to form a nodule.

**5 marks each**

1. What is photophosphorylation? Where does it take place? With the help of a flow chart only, describe the process occurring when the illumination is equal to 680nm. What are the products of this process?
2. What is photorespiration? Why does it happen? Why is it considered a wasteful process? How do plants overcome these losses?
3. Explain the Z scheme of photosynthesis.



**Chapter 14**  
**RESPIRATION IN PLANTS**

**1 mark each**

1. What are the end products of anaerobic respiration in a plant cell and animal cell?  
Name the connecting link between glycolysis and TCA cycle.
2. Where is  $O_2$  used in the process of respiration?
3. Where does the ETS operate in the cell?
4. What is the role of the  $F_0-F_1$  particles in respiration?
5. Which intermediate is oxidized during glycolysis to form  $NADH.H^+$ ?
6. What is the acceptor molecule in Krebs's cycle?
7. Which is the first product in TCA cycle?
8. ETC acceptors in the mitochondrial membrane are arranged along-----.

**2 marks each**

1. How is pyruvic acid converted to ethyl alcohol?
2. In mitochondria, name the specific regions responsible for the different steps of respiration.

**3 marks each**

1. Krebs's cycle is a common metabolic pathway for carbohydrates, fats and proteins.  
Explain.
2. Respiration is considered to be an amphibolic pathway. Explain.
3. What is RQ? Derive the RQ value for carbohydrates, fats and proteins.

**Chapter 15**  
**PLANT GROWTH AND DEVELOPMENT**

**1 mark each**

1. Growth can be measured by an \_\_\_\_\_
2. Where are auxins synthesized? \_\_\_\_\_
3. Function of auxins are \_\_\_\_\_
4. Natural auxins are \_\_\_\_\_ and synthetic auxins are \_\_\_\_\_

5. A bioassay for auxin is \_\_\_\_\_
6. Define critical period.
7. Cut leaves remain green longer if sprayed with \_\_\_\_\_  
\_\_\_\_\_
8. Cytokinin was first isolated from \_\_\_\_\_
9. The pigment that helps in seed germination is \_\_\_\_\_  
\_\_\_\_\_
10. Hormone responsible for photoperiodism is \_\_\_\_\_  
\_\_\_\_\_
11. Enlist the conditions for verbalization.
12. Statoliths are starch grains found in roots. Their movement causes \_\_\_\_\_  
\_\_\_\_\_
13. Why do the seeds not germinate immediately after they are released from the fruits?
14. How will you artificially ripen raw fruits?

**2 marks each**

1) Fill in the table:

S.No.	Hormone	Function/application
1	_____	Overcome seed dormancy
2	Ethylene	_____
3	_____	Hormone causing ageing
4	_____	Bolting
5	_____	Used as a weedicide
6	_____	Stress hormone

**Chapter 16****DIGESTION AND ABSORPTION****1 mark each**

1. State the function of enterokinase.
2. Why is the larynx raised while swallowing food?
3. What is chyme?
4. Name the kind of movement and the muscles involved in sending the food down the gut.
5. What are the three parts of the colon?

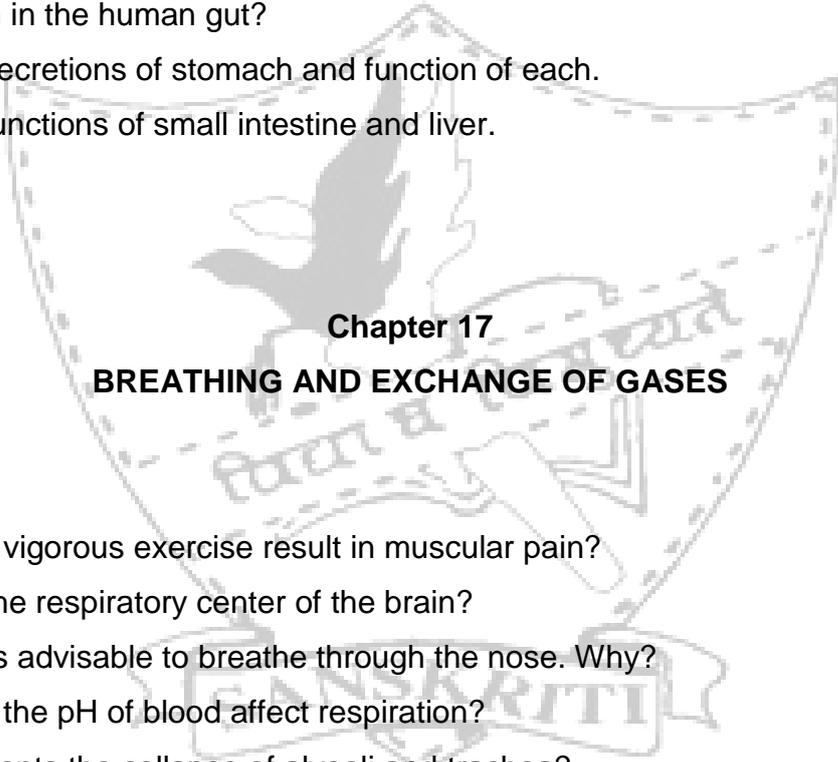
6. Name the protein digesting enzymes secreted by the gastric glands.

**2 marks each**

1. How does the liver serve as a digestive and excretory organ?
2. In what form are enzymes secreted in the gut? Why?
3. What is the site of fat and protein digestion in humans? Name the enzyme that digests fats and protein. Mention the end products of digestion of each.

**3 marks each**

1. What are chylomicrons? How are they different from micelles? What is their role in fat absorption in the human gut?
2. Give the secretions of stomach and function of each.
3. Give the functions of small intestine and liver.



**Chapter 17**  
**BREATHING AND EXCHANGE OF GASES**

**1 mark each**

1. Why does vigorous exercise result in muscular pain?
2. Which is the respiratory center of the brain?
3. It is always advisable to breathe through the nose. Why?
4. How does the pH of blood affect respiration?
5. What prevents the collapse of alveoli and trachea?
6. What prevents the damage of the delicate alveoli from the particulate matter of the air?

**2 marks each**

1. The process of gas exchange never stops in the lungs. Comment.
2. Explain
  - (a) More  $O_2$  is released from oxyhaemoglobin in a more active tissue than in a less active one.
  - (b) Oxygenation of blood promotes release of  $CO_2$  from in the lung.

3. What are the muscles that are involved in breathing? How do they function?

**3 marks each**

1. What is the role of carbonic anhydrase? Show by a series of reactions, how carbonic anhydrase starts reaction leading to formation of haemoglobinic acid.
2. Define the terms:  
Tidal volume, Respiratory quotient, Vital capacity.

**5 marks each**

1. How are  $\text{CO}_2$  and  $\text{O}_2$  carried by blood? What are the factors affecting the  $\text{O}_2$  dissociation curve?



**Chapter 18****BODY FLUIDS AND CIRCULATION****1. Mark each**

2. Why is blood group identification not required while transfusing blood?
3. Where does the cardiac impulse originate?
4. Name the membrane that covers the heart.
5. What is the role of the Purkinje fibres?

**2 marks each**

1. How is the foetus with Rh-positive blood affected if the mother is Rh- negative?
2. Human heart is myogenic. Explain. Name the nerve that can reduce heart rate.
3. What causes the heart sounds?
4. Name the different valves found in the heart. What is the function of these valves?
5. Discuss atherosclerosis and arteriosclerosis as heart circulatory disorders.

**3 marks each**

1. Name any 6 blood vessels associated with the heart.
2. Which part of the heart is called the pacemaker? Why? Name the disease that occurs due to its failure to function.
3. Plasma contains 3 classes of proteins. What are these? Give their functions.
4. Draw a standard ECG and explain the different segments in it.
5. Explain in detail the cardiac cycle.

**Chapter 19****EXCRETORY PRODUCTS AND THEIR ELIMINATION****1 mark each**

Fill in the blanks:

1. Bowman's capsule is a part of \_\_\_\_\_.
2. The liquid collected in the Bowman's capsule is called \_\_\_\_\_.
3. Reabsorption of water in nephrons is regulated by \_\_\_\_\_.

4. Ph of urine is normally \_\_\_\_\_.
5. \_\_\_\_\_ Hormone controls the reabsorption of  $\text{Na}^+$  in the nephrons.

**2 marks each**

- 1) What is the blood vessel that
  - (a) is present in the Bowman's capsule
  - (b) Enters and leaves the Bowman's capsule
  - (c) Surrounds the PCT, DCT
  - (d) Enters and leaves the kidneys.
- 2) Enlist 3 ways by which animals excrete nitrogenous wastes. Which product requires minimum water for excretion?

**3 marks each**

- 1) How does the proximal convoluted tubule contribute to homeostasis?
- 2) Give examples of ureotelic, uricotelic and ammonotelic animals.
- 3) What kind of substance are reabsorbed in the ascending limb, descend limb, DCT of the nephron.
- 4) Describe the role of ADH on formation of hypertonic urine.
- 5) What are the factors that favor glomerular filtration?
- 6) Discuss the role of Renin Angiotensin mechanism in osmoregulation.

**5 marks each**

- 1) Explain the process of urine formation.

**Chapter 20****LOCOMOTION AND MOVEMENT****1. Mark each**

1. What are antagonistic muscles? Give 1 example.
2. Name the tissue that connects muscle to bone and the one which connects muscle to muscle..
3. What are troponin and Tropomyosin?

**2 marks each**

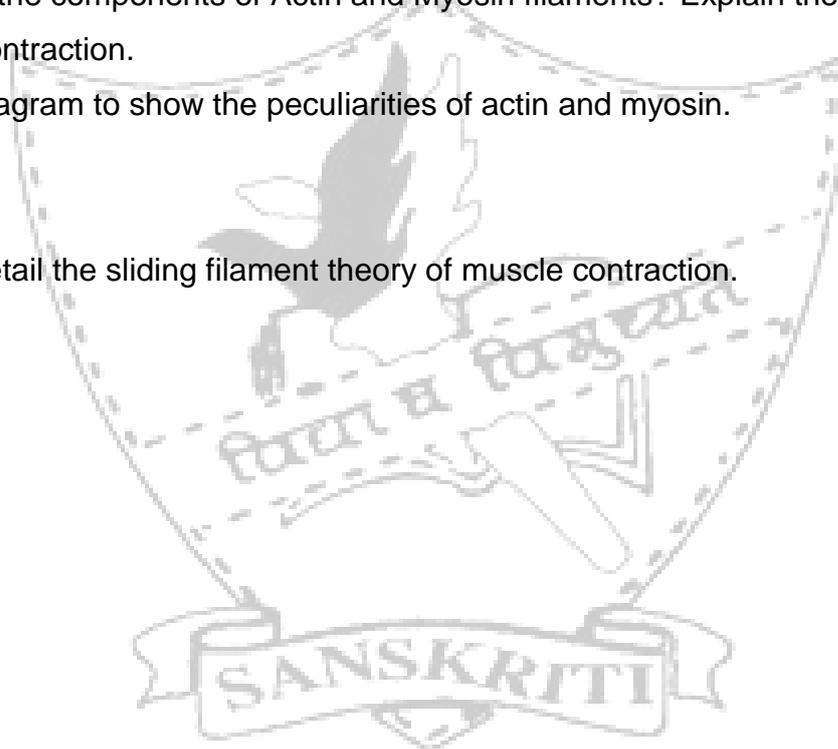
1. List 4 functions of the skeletal system.
2. The hormones secreted by the posterior pituitary are neurosecretions. Justify.
3. Point out 2 common features in a hinge and ball and socket joint.
4. What is the function of  $\text{Ca}^{++}$  in muscle contraction?

**3 marks each**

1. How many pairs of ribs are found in humans? How would you categorize them on the basis of their attachment? Explain.
2. What are the components of Actin and Myosin filaments? Explain the role of each in muscle contraction.
3. Draw a diagram to show the peculiarities of actin and myosin.

**5 Marks**

1. Describe in detail the sliding filament theory of muscle contraction.



## Chapter 21

## NEURAL CONTROL AND COORDINATION

**1 mark each**

1. Name the fluid in which the membranous labyrinth floats.
2. Name the area of the retina that contains only cones and no rods.
3. State the function of the pineal gland.
4. What kind of pigment is found in the rods and the cones?

**2 marks each**

1. Give 4 examples of reflex actions.
2. Trace the path of the sympathetic nerve fiber as it leaves the ventral root of the spinal cord and reaches the effector organ.
3. Name the space and cavities through which the CSF circulates. List the functions of the CSF.
4. What do you understand by accommodation of the eye?
5. Give the technical terms for the ear ossicles. What is their function?
6. What happens when the membrane of a nerve cell carries out a sodium pump?
7. What are layers of the retina?
8. Describe the Organ of Corti.

**3 marks each**

1. Where are the following located and state their function: hypothalamus, cerebellum, corpus callosum
2. Draw a diagram of the T S of the spinal cord and label afferent nerve, motor nerve, gray matter.

**5 marks each**

1. What are the events that take place at the point of stimulation of an axon?
2. How does synaptic transmission take place?

## Chapter 22

## CHEMICAL COORDINATION AND INTEGRATION

**1 mark each**

1. Name the birth hormone.
2. What do you understand by target organs?
3. Why Pituitary is called the master gland?
4. What is the hypothalamo-hypophyseal tract?

**2 marks each**

1. What causes cretinism? Name any other hormone secreted by the same gland and state its function
2. Give technical terms for anterior and posterior pituitary.
3. Name a few hormones that work synergistically and some that work antagonistically.

**3 marks each**

1. What hormones are produced when the body's blood glucose level drops below normal? How do these hormones act to return the level to normal?
2. Distinguish between diabetes mellitus and diabetes insipidus. Mention any 1 common symptom of the diseases.
3. What are the 2 forms of thyroxine? Which is more active? Name the amino acid used to prepare thyroxine.
4. Explain how the pituitary and the hypothalamus function as an integrated system.

**5 marks each**

1. How do protein hormones affect changes in their target organs? Explain with the help of an example. How is it that a few molecules of hormones are able to produce widespread effect in the target organ?
2. Explain in detail the cellular effect of a steroid and non steroid hormone.

**PROJECT (summer vacation work)**

The Biology students are required to submit a research based project report on any one of the following topics. This is a tentative list and the students are free to choose any other topic of their interest.

Please note that the project work is a compulsory part of grade XII practical examination.

New Age diseases

Modern Vaccines

Global food crisis

Lifestyle diseases

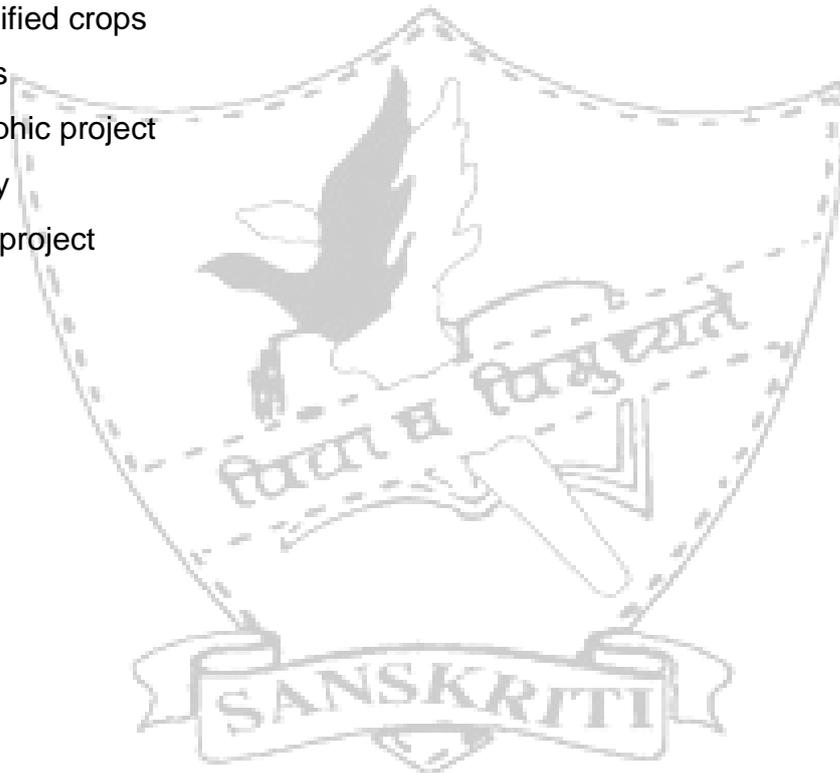
Genetically modified crops

Genetic diseases

Human genographic project

Stem cell therapy

Human genome project



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## Practice Paper

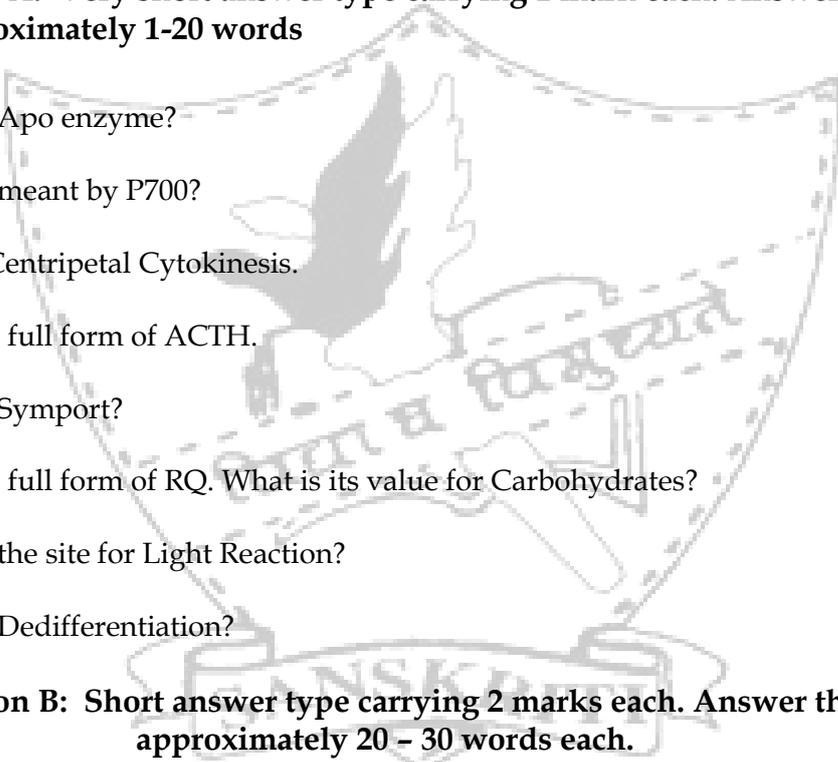
Time: 3hours

Max. Marks: 70

### General Instructions

- a. This question paper consists of 4 sections A, B, C, and D. Section A contains 8 questions of 1 mark each. Section B contains 10 questions of 2 marks each. Section C contains 9 questions of 3 marks each and Section D contains 3 questions of 5 marks each.
- b. This paper has 2 printed pages.

**Section A: Very short answer type carrying 1 mark each. Answer them in approximately 1-20 words**

- 
- Q1. What is Apo enzyme?
  - Q2. What is meant by P700?
  - Q3. Define Centripetal Cytokinesis.
  - Q4. Give the full form of ACTH.
  - Q5. What is Symport?
  - Q6. Give the full form of RQ. What is its value for Carbohydrates?
  - Q7. What is the site for Light Reaction?
  - Q8. What is Dedifferentiation?

**Section B: Short answer type carrying 2 marks each. Answer them in approximately 20 - 30 words each.**

- Q9. Give the structure and functions of RER.
- Q10. Give 2 differences between Cilia and Flagella.
- Q11. Define Photorespiration. Why does it occur?
- Q12. Explain briefly Reflex Action.
- Q13. Transpiration is a necessary evil for plants. Justify giving any two functions.
- Q14. Describe the functions of WBC and Platelets.
- Q15. Write a short note on Amphibolic nature of Respiration.

- Q16. Explain briefly critical concentration of a nutrient. Give 2 examples of Macronutrient.
- Q17. What is Blackman's law of limiting factor? Explain the effect of Temperature on rate of photosynthesis.
- Q18. Differentiate between Metacentric and Acrocentric chromosome. What is a Satellite?

**Section C: Short answer type carrying 3 marks each. Answer them in approximately 30 - 50 words each.**

- Q19. Give the discovery, role and applications of Auxin.
- Q20. Describe the three steps of Calvin cycle.
- Q21. Give the structure and location of unipolar, bipolar and multipolar Neurons.
- Q22. Explain the mode of action of a Protein hormone.
- Q23. What are the monomers of a Polypeptide? Give 2 examples. Name the bond that joins these monomers.
- Q24. Explain along with a diagram the structure of Human Heart.
- Q25. Describe the hormones of Thyroid along with their functions. Add a note on the problems that arise due to underproduction of these hormones.
- Q26. Along with a diagram describe the 2 ways in which water moves in the plants.
- Q27. Give an account of Biological Nitrogen Fixation.

**Section D: Long answer type carrying 5 marks. Answer them in approximately 80 - 120 words each.**

- Q28. Describe in detail the generation and conduction of transmission of a nerve impulse.
- Q29. Give an account of events occurring during muscle contraction.

## Open Text Book Assessment OTBA

CBSE has introduced an open text book assessment in Biology. The term II (Final paper) will be of 60 marks with 10 marks from OTBA material. This material changes every year and is related to day to day application and problem solving.

