

White House International College, Subidhanagar

Subject : Biology

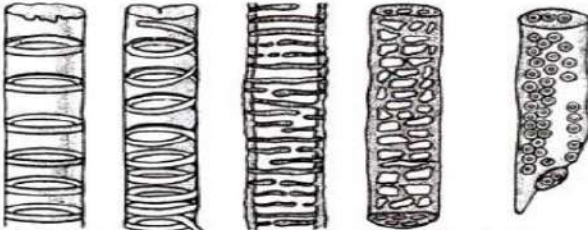
Set : I

**Part: I ( Botany)**

**Group : A**

Circle the correct answer from the given alternatives. ( 5x1=5 )

1. If T=60%, C=20% then G= ? in DNA of embryo cell  
a. 60%                      b. 80%                      c. 20%                      d. 40%
2. There are 10 flower in one individual plant of Pea. In each microsporangium of every stamen of all the flowers, there are 30 microspore mother cells. How many pollen grains are formed from that plant ?  
a. 4,000                      b. 10,000                      c. 48,000                      d. 24,000
3. The diffuse porous plant differ from ring porous plant by (understanding)  
a. Formation of secondary phloem                      b. Formation of secondary xylems  
c. No formation of annual rings                      d. Formation cambium ring
4. The following diagram show the types of secondary thickening in the xylemvessels. Identify the types labelled from A to E. Choose the correct option from those given.



- a. A-Spiral, B-Annular, C-Reticulate, D Scalariform, E-Pitted.  
b. A-Annular, B-Spiral, C-Scalariform, D-Reticulate, E-Pitted.  
c. A-Annular, B-Spiral, C-Scalariform, D-Reticulate, E-Pitted.  
d. A-Spiral, B-Annular, C-Scalariform, D-Reticulate, E-Pitted
5. Meristem culture is practiced in horticulture to get  
a. Somaclonal variation                      b. Haploids  
c. Virus-free plants                      d. Slow-growing callus

**Group : B**

Give short answers to the following questions. ( 4x4=16 )

1. "Biotechnology improve the sustainable agriculture" justify the statement.
2. In which plant, red flower crossed with white flower, then in F-1 generation the all offsprings are pink ?  
What are the possible offsprings are in F-2 generation and how ?  
or  
What are the root initiating hormones ? Write the physiological effects of gibberellins.
3. Describe the merits and demerits of cross pollination.
4. Describe the tunica and corpus theory

**Group : C**

Give long answers to the following questions.

1. "DNA is a self-replicating material of cell". State and explain the different steps of mechanism in which DNA is self replicated.

OR

- What is linkage ? Describe the complete and incomplete linkage with suitable examples.
2. What is respiration ? Describe the mechanism of respiration in which carbohydrate completely oxidized.

**Part : II ( Zoology)**

**Group A**

Circle the correct answers from given alternatives.

6x1=6

- What is the time taken by atrial systole in a cardiac cycle?**  
a. 0.1 sec                      b. 0.2 sec                      c. 0.3 sec                      d. 0.4 sec
- Which of the following occurs in hypothyroidism?**  
a. lowering of body temperature                      b. increase in BMR  
c. decrease in respiratory rate                      d. excessive fat accumulation
- Which of the following is present on the surface of epithelial lining the intestine and help in absorption of digested food?**  
a. phagocytic vesicles                      b. zymogen granules  
c. microvilli                      d. cilia
- Amniocentesis is a prenatal test. Which of the following can be detected by Amniocentesis?**  
a. obesity                      b. diabetes                      c. down's syndrome                      d. marasmus
- Which of the following statement is true for IVF technology?**  
a. a baby born in test tube  
b. an ovum made to fertilize in vitro and then implanted in the uterus  
c. a method of tissue culture  
d. unfertilized egg is used in the development
- COPD is respiratory disease. Which one of the following is correct for COPD?**  
a. Chronic obstructive pulmonary disease                      b. common cold pneumonia disease  
c. chronic operated and pulmonary disease                      d. common pneumonia disease

**Group B**

Give short answers of the following questions

4x4=16

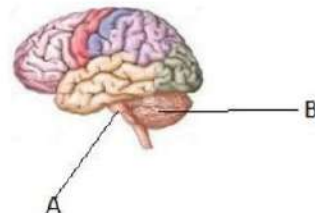
- Write similarities and differences between simple and compound epithelium. 4
- Differentiate between sympathetic and parasympathetic nervous system. 4

Or

Give short account on different respiratory disorders

4

- study the given diagram and answer following questions 2+2=4  
a. label A and B  
b. write two differences between A and B



- Describe types and structure of human tooth. Mention the role of human tooth in the process of digestion. 2+2=4

**Group C**

Give long answers of the following questions

2x8=16

- What is heart beat? Discuss the origin and conduction of heart beat. Suggest the solution for the injury in the SA node. 1+ 4+3=8

Or

Draw labeled diagram of alimentary canal of human beings. Describe the process of digestion of food. what would happen if the gall bladder is surgically removed?

- Mention the causative agent, mode of transmission, symptoms and control measures of tuberculosis in the community. 1+2+3+2=8

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Subject : Biology

Set : II

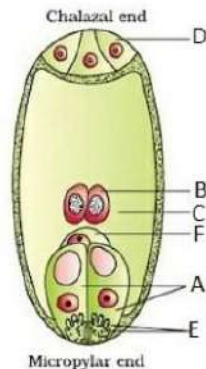
Part: I ( Botany)

Group : A

Circle the correct answer from the given alternatives.

( 5x1=5 )

1. When a mutation is limited to the substitution of one nucleotide for another, it is called
  - a. Translocation
  - b. Point mutation
  - c. Sugar phosphate deletion
  - d. Frameshift
2. In the given diagram, parts labelled as A, B, C, D, E and F are respectively identified as



- a. Synergids, polar nuclei, central cell, antipodals, filiform apparatus and egg
  - b. Polar nuclei, egg, antipodals, central cell, filiform apparatus and synergids
  - c. Egg, synergids, central cell, filiform apparatus, antipodals and polar nuclei
  - d. Antipodals, polar nuclei, central cell, synergids, filiform apparatus and egg
3. Tyloses are balloon-like ingrowths in vessels developing from the adjoining
    - a. Fibres through pits on vessel wall.
    - b. Fibres through the general surface of vessel wall.
    - c. Parenchyma through pits on vessel wall.
    - d. Parenchyma through the general surface of vessel wall
  4. A suitable vector for gene cloning in higher organisms is
    - a. Baculovirus
    - b. Retrovirus
    - c. Salmonella typhimurium
    - d. Neurospora crassa
  5. Opening of stomata is not affected by
    - a. N<sub>2</sub>
    - b. K<sup>+</sup> ions
    - c. Starch
    - d. None of these

Group : B

Give short answers to the following questions.

( 4x4=16 )

1. "Recombinant DNA technology remove the unwanted characters of an organism" justify this statement by describing with various related steps.
2. What do you mean by genetic material ? Describe the structure and functions of any one genetic material.

OR

- Describe the briefly the types of tropic movement.
3. How embryo formed in dicot plant ?
  4. Which theory of ascent of sap is most acceptable and describe that theory.



**Group : C**

**Give long answers to the following questions.**

1. One of the mendelian inheritance states that “The alleles of different characters can be segregated during gametogenesis and passed independently”. State and explain the necessary pattern of inheritance verifying the statement with suitable examples showing crosses up to second filial generation .

OR

What is X-linked inheritance ? Describe the X-linked inheritance with suitable examples and show the reciprocal crosses with ratio.

2. What is photosynthesis ? Describe the mechanism of photosynthesis occur in  $C_4$  plant .

**Part : II ( Zoology )**

**Group A**

**Circle the correct answer from the given alternatives**

**6x1=6**

1. **The small intestine has three parts. Which of the following is the first part of small intestine?**  
a. duodenum                      b. esophagus                      c. larynx                      d. colon
2. **What is enzyme that breaks down lactose?**  
a. lipase enzyme                      b. pepsin                      c. amylase                      d. lactase
3. **Which type of following immunization is provided by vaccine?**  
a. active                      b. passive                      c. both a and b                      d. none of above
4. **Which of the following hormone causes Cretinism during its hyposecretion?**  
a. thyroxine                      b. calcitonin                      c. parathormone                      d. adrenaline
5. **Which of the following structure at a synapse has the neurotransmitter?**  
a. Schwann cells                      b. synaptic cleft                      c. synaptic knob                      d. synaptic vesicle
6. **In which of the following stage blastopore is present?**  
a. morula                      b. blastula                      c. gastrula                      d. neurula

**Group B**

**Give short answers of the following questions**

**4x4=16**

1. Explain various functions of kidney in human body. 2+2=4  
2. Write briefly about in vitro fertilization. Give two benefits of this technique. 2+2=4

Or

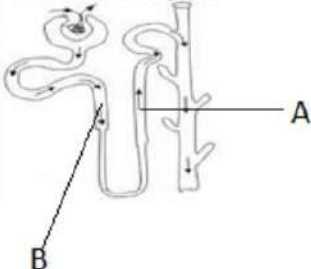
Compare and contrast between nerve cells and neuralgia cells 2+2=4

3. Study the given diagram and answer the following questions 2+2=4

a. label A and B

b. Write two differences between A and B

Structure of the Nephron



4. Ectoderm, mesoderm and endoderm are primary germinal layer. Justify this statement. 4

**Group C**

**Give long answers of the following questions**

**2x8=16**

5. Mention the causative agent, mode of transmission, symptoms and control measure of typhoid in the Nepalese society. 1+2+3+2=8

Or

Define respiration. Explain why and how Oxygen and carbon dioxide are exchanged rapidly in the lungs. Explain chloride shift in brief. 1+4+ 2+1=8

6. What is endocrine system? Discuss the hormones produced from anterior lobe of Pituitary gland. What will happen to a person if Beta cells of pancreas are damaged? 1+ 5+2=9

**Subject : Biology**

**Set : III**

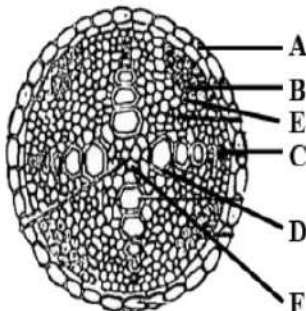
**Part: I ( Botany)**

**Group : A**

**Circle the correct answer from the given alternatives.**

**( 5x1=5 )**

1. A mutation changes the original base sequence of DNA, GATAGCCG to a new sequence GGTAGCCG. What is the type of mutation?  
a. Transition                      b. Transversion                      c. Translocation                      d. Inversion
2. A normal plant suddenly started reproducing parthenogenetically. The number of chromosomes of the second generation as compared to the parent will be  
a. One half                      b. One forth                      c. Same                      d. Double
3. In the diagram of t.s. of stele of dicot root, the different parts have been indicated by alphabets, choose the answer in which these alphabets correctly match with the parts indicate.



- a. A-Endodermis, B-Phloem, C- Protoxylem, D-Metaxylem, E- Conjunctive tissue, F-Pith  
b. A-Phloem, B-Endodermis, C-Protoxylem, D-Metaxylem, E-Conjunctive tissue, F-Pith.  
c. A-Endodermis, B-Phloem, C-Metaxylem, D-Protoxylem, E-Conjunctive tissue, F-Pith.  
d. A-Phloem, B-Endodermis, C-Conjunctive tissue, D-Metaxylem, E-Protoxylem, F-Pith.

4. **Natural genetic engineer is**

- a. *Bacillus subtilis*                      b. *Pseudomonas sp*  
c. *Escherichia coli*                      d. *Agrobacterium tumefaciens*

5. **Plastocyanine contains**

- a. Copper                      b. Iron                      c. Calcium                      d. Potassium

**Group : B**

**Give short answers to the following questions.**

**( 4x4=16 )**

1. What careers are available in biotechnology, and how do they play a role in society ?  
2. What is genetic codon ? Write the characteristics of genetic codons ?

OR

Discuss “the respiratory pathway is an amphibolic pathway”.

3. Differentiate microgametogenesis and megagametogenesis.  
4. List the anatomical differentiation between dicot root and dicot stem.

**Group : C**

**Give long answers to the following questions.**

1. What is mutation ? Describe its various types and its significances.

OR

What is DNA replication ? Describe the mechanism of semi-conservative method of DNA replication.

2. What is transpiration ? Describe the types and mechanism of transpiration.

**Part : II ( Zoology )**

**Group A**

Circle the correct answers from given alternatives

6x1=6

1. **Cardiac output is volume of blood pumped out in one minute time. Which of the following is correct value of cardiac output?**  
a. 2040 ml                      b. 3040 ml                      c. 4040 ml                      d. 5040 ml
2. **Which of the following occurs in hyperthyroidism?**  
a. lowering of body temperature                      b. increase in BMR  
c. decrease in respiratory rate                      d. excessive fat accumulation
3. **Which of the following is present on the surface of epithelial lining the renal tubule and help in absorption?**  
a. phagocytic vesicles                      b. zymogen granules  
c. microvilli                      d. cilia
4. **Balanced diet is referred to all. Which of the following is characteristic for malnutrition?**  
a. obesity                      b. AIDS  
c. down's syndrome                      d. Smoking
5. **Organ transplantation is modern technology to save life. Which of the following is correct for isograft?**  
a. a baby born in test tube  
b. an ovum made to fertilize in vitro and then implanted in the uterus  
c. a method of tissue culture  
d. Organ transplation between two genetically identical individuals.
6. **What is the full form of COPD?**  
a. Chronic obstructive pulmonary disease                      b. common cold pneumonia disease  
c. chronic operated and pulmonary disease                      d. common pneumonia disease

**Group B**

**Give short answers of the following questions**

4x4=16

1. Write similarities and differences between blood and lymph.                      2+4=4  
2. Differentiate between cranial nerves and spinal nerves.                      4

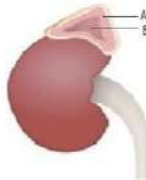
Or

Give short account on Hipatitis B.

4

3. study the given diagram and answer following questions                      2+2=4

- a. label A and B  
b. write two differences between A and B



4. Describe dentition in human beings. Mention the role of human tooth in the process of digestion.                      2+2=4

**Group C**

**Give long answers of the following questions**

**2x8=16**

5. Hormones play great role in the human body. which hormone is produced by parathyroid gland? Write the role of hormones produced by parathyroid gland. What would happen in case of hypersecretion of parathormone? 1+ 4+3=8

Or

Draw labeled diagram of human lungs. Differentiate between inhalation and exhalation. what would happen if CO<sub>2</sub> is not transported from tissue to lungs? 2.5+4+ 1.5=8

6. Mention the causative agent, mode of transmission, symptoms and control measures of AIDS in the community. 1+2+3+2=8

**Subject : Biology**

**Set : IV**

**Part: I ( Botany)**

**Group : A**

**Circle the correct answer from the given alternatives.**

**( 5x1=5 )**

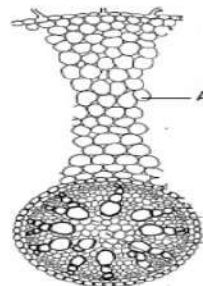
1. **A normal woman whose father was haemophiliac marries with a normal man. The offspring shall be (application)**  
a. All normal b. All sons haemophiliac  
c. All daughters haemophiliac d. Some sons are haemophiliac
2. **When a microspore mother cell with 40 chromosomes under goes to meiosis, each of the four resulting cells has**  
a. 40 chromosomes b. 10 chromosomes c. 20 chromosomes d. 5 chromosomes
3. **The phloem of angiosperms differs from that of other vascular plants by the presence of**  
a. Vessels b. Companion cells c. Tyloses d. Albuminous cells
4. **Somatic hybrids are produced by**  
a. Protoplast fusion b. Tissue culture c. Pollen culture d. Hybridoma process
5. **Oxygenic photosynthesis occurs in**  
a. Chromatium b. Oscillatoria c. Rhodospirillum d. Chlorobium

**Group : B**

**Give short answers to the following question**

**s. ( 4x4=16 )**

1. How synergid cells are formed in ovule ?  
2. Study the given diagram and answer the following questions:



- a. Write the characteristics of the given layer – A .  
b. Draw the given diagram and label the tissue which is responsible for formation of lateral roots.  
How this tissues prevent the flow of water ?
3. Describe the linkage with suitable examples  
OR  
How pyruvic acid formed from glucose ?
4. Describe the process of plant breeding.



**Group : C**

**Give long answers to the following questions.**

1. What is criss-cross inheritance ? Discuss about the sex-linked inheritance with reference to the colour blind disease of human.

OR

What is mendelism ? Describe Mendel's law of inheritance.

2. What is photosynthesis ? Draw the diagrammatic sketch of  $C_3$  cycle and write the factors affecting the rate of photosynthesis.

**Part : II ( Zoology )**

**Group : A**

**Circle the correct answer from the given alternatives**

**6x1=6**

1. **The lining of blood and lymph vessels is called**  
a. mesothelium      b. endothelium      c. urothelium      d. myoepithelium
2. **Chordae tendineae are found in**  
a. ventricle of heart      b. auricle of heart      c. joints      d. ventricles of brain
3. **When population reaches carrying capacity**  
a. mortality rate = birth rate      b. mortality rate > birth rate  
c. mortality < birth rate      d. population explosion.
4. **The kidney lies on**  
a. anterior abdominal wall      b. posterior abdominal wall  
c. above the diaphragm      d. inside the peritoneum
5. **The causative agent of AIDS is**  
a. retro virus      b. rota virus      c. rhabdo virus      d. pox virus

**Group B**

**Give short answers of the following questions**

**4x4=16**

1. Describe the process of neural tube formation in frog with necessary diagram.

OR

Explain the fate of three germ layers.

2. Write short notes on applications of microorganisms.  
3. What are the types of WBC ? Mention the role of granulocytes.  
4. Write in brief about respiratory disorders.

**Group C**

**Give long answers of the following questions**

**2x8=16**

5. Describe the internal structure of human heart and its working mechanism

OR

Describe the structure and functions of human ear.

6. Mention the causative agent, mode of transmission, symptoms and control measures of Typhoid.





2. What is plant movement? Describe the different types of plant movement.

**Part : II ( Zoology )**

**Group : A**

**Circle the correct answer from the given alternatives**

**6x1=6**

1. **The stretchable epithelium is called**  
a. ciliated                      b. stratified columnar      c. transitional                      d. stratified cuboidal
2. **Hepatic portal system starts from**  
a. kidney to liver                      b. digestive system to liver  
c. liver to heart                      d. liver to kidney
3. **A population with natality equal to mortality is**  
a. increasing                      b. decreasing  
c. stable                      d. growing
4. **The term trigone is associated with**  
a. kidney                      b. ureter                      c. urinary bladder                      d. urethra
5. **Typhoid is mainly transmitted through**  
a. droplets                      b. faeco-oral route                      c. sexual contact                      d. direct contact

**Group B**

**Give short answers of the following questions**

**4x4=16**

1. Describe the formation of coelom in frog's embryo with diagram  
OR  
Describe the process of fertilization in frog
2. Write short note on cholera.
3. Prepare a comparative chart of muscles in human body.
4. Write in brief about poultry farming.

**Group : C**

**Give long answers to the following questions.**

5. Mention the causative agent, mode of transmission, symptoms and control measures of pulmonary TB.
6. Describe structure, histology and function of human alimentary canal.

OR

Describe the structure and functions of human brain.