

Model Question (NEB)
Subject : Biology

Time : 3 hrs
Attempt all questions

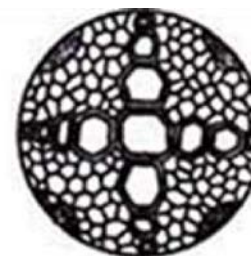
F.M.: 75

Part: I [Botany]
Group 'A'

Circle the correct answer from the given alternatives.

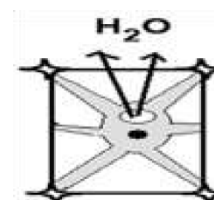
(5 × 1 = 5)

- There are many types of chromosomal disorders in organisms, among them euploidy is very common in the population. Which one of the following conditions is true for euploidy?
 - Addition or deletion of one or more chromosome in diploid chromosome
 - Addition of one or more chromosome in diploid chromosome
 - Deletion of one or more chromosome in diploid chromosome
 - Addition or deletion of one set or more than one set of chromosomes in diploid chromosome
- The formation of two male gametes is a peculiar feature in angiosperms. If the first male gamete is fused to oosphere, in which part does the second male gamete fuse?
 - Synergids
 - Egg cell
 - Polar nuclei
 - Antipodal cell
- The given vascular bundle is highly specialized by centripetal protoxylem. What is it called?
 - Exarch
 - Endarch
 - Mesarch
 - Centrach



- Which of the following plants is used as bio fertilizer?
 - Volvox*
 - Funaria*
 - Azolla*
 - Rhizopus*

- When a plant cell is placed in a hypertonic solution, it gets plasmolysed as shown in the diagram. Which of the following occupies the space between the cell wall and the shrunken protoplast in such plasmolysed cell?
 - Water
 - Hypertonic solution
 - Isotonic solution
 - Hypotonic solution



Group 'B' Botany

Give short answers to the following questions.

[4 × 4 = 16]

- The anatomical structure of the vascular plant is given. Study the given diagram and answer the following questions.
 - Write the main characteristics of the given layer Y.
 - Draw the given diagram and label the tissues which are responsible for secondary growth. Elaborate the activities of this tissue up to the formation of a cambial ring.
- Write the salient features of a monocot embryo in reference to its development pattern with diagrams.
- “Micropropagation is an analytical and conventional bulk breeding technique for rapid cloning of desirable stock”. Justify the statement by describing it briefly with the various stages of micropropagation technique in plants. (4)

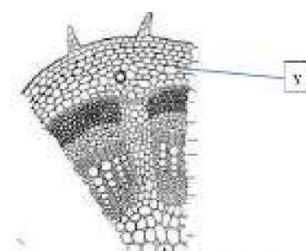


Figure-1

(3+1=4)

4. What is genetic material? Describe the structure and functions of RNA. (1+2+1=4)

OR

What are plant growth hormones? Write the physiological functions of auxin. Mention its shortcoming of hyper use in crops.

Group 'C'

Give long answers to the following questions.

[2 × 8 = 16]

5. One of the Mendelian inheritances states that "The alleles of different traits can be segregated during gametogenesis and passed independently". State and explain the essential pattern of inheritance verifying the statement with examples showing cross up to second filial generation with chart and ratio. (1+ 3+2+2= 8)

OR

In *Drosophila*, an eye colour is X-linked. Explain. If white eyed female *Drosophila* is crossed to red eye male *Drosophila*, what result do you expect? Analyze briefly with the help of crosses.

6. How are the Glycolysis and Krebs (TCA) cycle linked? Draw a detailed flow chart of the Krebs cycle? (4+ 4= 8)

Part: II (Zoology)

Group A

Circle the correct answer from the given alternatives.

(6 × 1 = 6)

- The parasympathetic nervous system releases a hormone acetylcholine. Which one of the following is activated by this hormone?
 - Regulate the involuntary response
 - Increase blood pressure
 - Decrease the rate of heart beat
 - Increase myocardial contractility
- After the release of mature ovum from the ovary, the Graffian follicle changes into corpus luteum which is the source of female sex hormones. In the woman, what would be the condition of corpus luteum in absence of pregnancy?
 - Secretes FSH and LH continuously
 - Automatically degenerates after sometime
 - Secretes oxytocin and relaxin
 - Remains intact and active
- Which of the following statements is more appropriate for an early amniocentesis test?
 - It takes place between 15th and 20th weeks of pregnancy
 - It may cause fetal injury and lethality
 - It helps to detect fetal complications
 - It may cause infertility
- What are the main processes involved in gastrulation of a frog?
 - Epiboly, involution, cleavage
 - Epiboly, invagination, Involution
 - Involution, epiboly, invagination
 - Involution, invagination, cleavage
- Blood cells are formed in the bone marrow. What is the process of formation of blood called?
 - Haemopoiesis
 - Haemolysis
 - Lymphopoiesis
 - Erythroblastosis
- A person suddenly falls down and becomes unconscious. A doctor checked and said that it is due to inadequate blood supply to the brain. What would be the type of disorder?
 - Asthma
 - Syncope
 - Heart attack
 - Oedema

Group 'B'

Give short answers to the following questions.

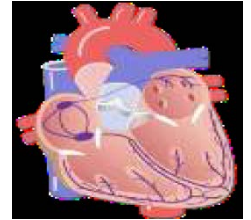
(4 × 4 = 16)

1. Compare and contrast areolar tissue and adipose tissue. (2+2=4)
2. Describe the process of fertilization of an egg with reference to a frog. (4)

OR

Describe the various steps applied in poultry farming. (4)

3. Study the given diagram and answer the following questions. (1+3=4)
(a) Label A and B.
(b) Write any three differences between A and B.



4. Overpopulation is a major issue in the development of the nation. Highlight the socio-economic problems caused by overpopulation and mention how to solve such problems. (2+2=4)

Group 'C'

Give long answers to the following questions.

[2 × 8 = 16]

5. Mention the causative agent, mode of transmission, symptoms and control measures of tuberculosis in the community. (1+2+3+ 2 =8)
6. Draw a labeled diagram of the alimentary canal of a human being. Explain the mechanism of the digestion of foods that a person undertakes. What would happen in digestion when the pancreas is removed? (3+4+1=8)

OR

Draw a labeled drawing of the respiratory system of humans. Why and how oxygen and carbon dioxide are exchanged so rapidly in the lungs? What would happen if a person moves to high altitude? Write your views on how to solve it. (2+4+1+1=8)

Model Question -1
(Biology XII)

Time: 3 hrs

F.M. :75

Part 1 (Botany)

Group A

Circle the correct one from given alternatives. **(5 × 1 = 5)**

1. The current sequence of nitrogen base pairing of DNA is
a. A = C b. A = G c. A = U d. A = T
2. Some plants vegetatively reproduce through underground modified stems. Which of the following plants do not reproduce through underground modified stems?
a. Potato b. Colocasia c. Sweet potato d. Ginger
3. Conjoint, collateral and open vascular bundles are characteristics of
a. dicot root b. monocot root c. dicot stem d. monocot stem
4. Kranz anatomy is characteristics of C₄ plants. Which of the following is a C₄ plant?
a. Rice b. Maize c. Wheat d. Pea
5. Which of the following plants is used as green manure?
a. Rice b. Maize c. Wheat d. Pea

Group B

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

1. What are annual rings? How are they formed? (1+3=4)
2. Double fertilization is the characteristic of angiospermic plants. How does it take place? Discuss it with relevant diagram. (3+1=4)
3. Define biotechnology. Discuss its application in the field of industry. (1+3=4)
4. How the phenotypic ratio of F₂ generation is obtained as 3:1? Discuss with necessary cross and relevant laws. (2+2=4)

Or

Where are auxins synthesized? Discuss their physiological effects. (1+3=4)

Group C

Give long answers to the following questions. **(2x8=16)**

5. What is criss cross inheritance? Discuss with reference to eye color in fruit fly with necessary crosses. (1+4+1.5+1.5=8)

Or

What are the characteristics of genetic materials? How is it proved that DNA is a genetic material? Discuss. (2+6=8)

6. Define respiration. What are its types? Discuss the factors affecting respiration. (1+2+5=8)

Part II (Zoology)

Group A

Circle the correct answer from the given alternatives. **(6·1=6)**

1. In which of the following organs, stratified epithelium is present?
a. buccal cavity b. ovary c. kidney d. urethra
2. Animal pole lies upward in frog egg because
a. it receives sperm. b. it is yolk free .
c. it absorbs light for development. d. it attracts the bacteria.

3. Which is the common passage for food and air?
a. pharynx b. larynx c. glottis d. gullet
4. The blood platelets are the source of
a. fibrinogen b. calcium c. thromboplastin d. hemoglobin
5. Which of the following is not a stimulant?
a. Caffeine b. Cocaine c. Amphetamines d. Tranquilisers
6. In Nepal amniocentesis is banned due to
a. genetic disease b. chromosomal abnormalities
c. knowing of the foetal sex d. finding genetic disorder

Group 'B'

Short answer question:

(4×4 = 16)

1. Give an account of the adipose tissue.
2. Give an account of the blastulation of frog.

OR

List various factors controlling population growth.

3. Draw a well labeled diagram of T.S. of testis human .
4. Give a short note on poultry farming in Nepal.

Group C

Long answer questions.

(8×2 = 16)

5. Describe the causes and symptoms of the disease hepatitis & cholera.
6. Describe the physiology of digestion in humans.

OR

Discuss the transmission of nerve impulse with a well labeled diagram.

**Model Question -2
(Biology XII)**

Time: 3 hrs

F.M. :75

**Part –I (Botany)
Group A**

Circle the correct one from given alternatives.

(5 ×1 = 5)

1. The current sequence of nitrogen base pairing of RNA is
a. A = C b. A = G c. A = U d. A = T
2. The process of development of pollen grains in the anther is known as
a. microsporogenesis b. megasporogenesis
c. microgametogenesis d. megagametogenesis
3. Cortical tissue in the internal parts of the plants are basically made up of
a. meristem b. parenchyma c. collenchyma d. sclerenchyma
4. When a plant cell is placed in a hypertonic solution, there is shrinkage of protoplasm due to the
a. diffusion b. imbibition c. plasmolysis d. deplasmolysis
5. Androgenic haploids are developed by the culture of
a. pollen grains b. ovules c. embryos d. seeds

Group B

Give short answer to the following questions. (4•4=16)

1. How does monocot root anatomically differ from dicot root? Discuss with diagrammatic sketches. (2+2=4)
2. Define embryogenesis? Discuss it in reference to monocot plants with necessary diagrams. (1+2+1=4)
3. What are biopesticides? How are they superior to synthetic pesticides? (1+3=4)
4. What were the reasons for the selection of the pea plant for the experiment of hybridization by Mendel? Name the seven pairs of contrasting characters that Mendel had selected for the experiment. (2+2=4)

Or

Opening and closing of stomata is regulated by the guard cells. How do the guard cells regulate? Discuss with relevant diagrams. (3+1=4)

Group C

Give long answer to the following questions. (2 × 8 = 16)

5. Define replication? Name the types of DNA replication. Discuss the mechanism of semi conservative mode of DNA replication with necessary diagrams. (1+1+4+2=8)

OR

What is dihybrid cross? How is the phenotypic ratio of F₂ generation obtained as 9:3:3:1? Discuss with necessary cross and justify the Law of Inheritance derived from the cross. (1+2+3+2=8)

6. Define photosynthesis. Discuss the process of conversion of solar energy into chemical energy during light reaction. How is the light reaction linked with the dark reaction? (1+6+1=8)

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives. (6•1=6)

1. Striped muscles have
a. one nucleus b. many nucleus c. two nucleus d. no nucleus
2. Grey crescent is present in
a. fertilized egg of frog b. eye of frog
c. retina of cockroach d. brain of rabbit
3. The nucleus in W.B.C. is
a. round b. oval c. spindle shaped d. irregular
4. The yellow color of urine in Vertebrates is due to
a. cholesterol b. urochrome
c. uric acid d. melanin
5. Mental retardation may be due to
a. cholesterol b. disease in the brain prior to birth
c. damage to the brain d. drug intake
6. Chicken raised specially for meat is known as
a. broiler b. pellets c. hen d. cockerels

Group B

Short answer question: (4×4 = 16)

1. Differentiate striped muscles from unstriped muscles.
2. Write a short note on cleavage in frog.

OR

What is population? Describe the trends of human population in Nepal.

3. Describe the chemistry of digestion of food in the small intestine.
4. Write the advantages of fish farming in Nepal.

Group C

Long answer questions.

(2×8 = 16)

5. Describe the causative agent, symptoms and control measures of Tuberculosis.
6. Describe structure and function of adrenal gland.

OR

Describe the structure and function of the human eye.

**Model Question -3
(Biology XII)**

Time: 3 hrs

F.M. :75

Part I (Botany)

Group A

Circle the correct one from the given alternative:

[5·1=5]

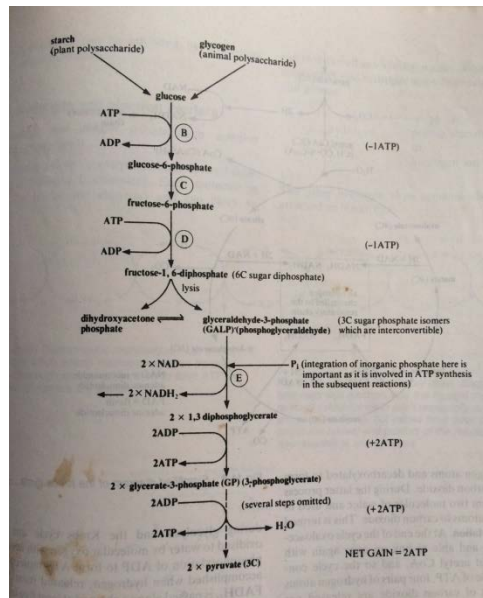
1. One of the following statements is true.
 - a. Bolting in rosette plants is due to activity of gibberellins.
 - b. Breaking of dormancy in seeds is because of cytokinins.
 - c. Parthenocarpic fruits can be produced by treatment with auxins.
 - d. All of the above.
2. Mendel studied seven contrasting characters for his breeding experiment with *Pisumsativum*. Which of the following he did not use ?
 - a. pod shape
 - b. leaf shape
 - c. plant height
 - d. pod color
3. Emasculation is achieved by removal of
 - a. anthers
 - b. styles
 - c. petals
 - d. sepals
4. is the first stable product during the C3 cycle.
 - a. Pyruvic acid
 - b. Water
 - c. Phosphoglyceric acid
 - d. None of above
5. Plants bend towards the light because
 - a. They need light for photosynthesis.
 - b. They need light for respiration.
 - c. Light attracts them.
 - d. Cells on the shaded side elongate fast due to activity of Auxin.

Group B

Give short answer to the following questions.

[4·4=16]

1. Study the figure carefully and answer the following questions :
 - a. What is the process occurring at B and D ?
 - b. What class of enzyme controls reaction C ?
 - c. Name the process occurring at E .
 - d. How many ATP are made in this process ?



2. Draw a well labeled diagram of a typical angiospermic ovule. And also describe its various parts. [2+2=4]
3. Calculate the offsprings from a cross between heterozygous red eyed female and normal eyed male of *Drosophila melanogaster* .
4. What is periderm ? Discuss the process of its formation . [1+3=4]

Or

Describe the types of plants on the basis of photoperiod required for them for flowering and fruiting.

Group C

Give long answers to the following questions:

[8•2=16]

5. Energy is required for every living organism. What is the ultimate source of it ? By which process plants release energy? Explain the mechanism of that energy releasing process which takes place in cytoplasm of the cell with the help of a graphic flow chart. [1+1+3+3=8]
6. What is mutation? Describe its types. [1+7=8]

OR

Give a brief biography of Mendel. Define dihybrid cross and explain the law related to it . [2+1+5=8]

Part –II (Zoology)

Group A

Circle the correct answer from the given alternatives.

(6•1=6)

1. Ciliated epithelium is not found in
 a. respiratory tract b. fallopian tube c. vasderence d. vrater
2. Fertilization in frog take place in:
 a. uterus b. fallopian tube c. water d. upper part of oviduct
3. Volume of urine is primarily controlled by
 a. ADH or Vasopressin b. oxytocin c. ACTH d. growth hormone.
4. Foramen of monro is found in:
 a. hip joint b. shoulder joint c. skull d. brain
5. Study of human population is called
 a. demography b. chronology c. population science d. census
6. Which one is not an indigenous fish?
 a. Grass carp b. Bhakur c. Rohu d. Naini

Group B

Give short answers to following questions.

(4×4 = 16)

1. Describe the internal structure of bones
2. How is coelom formed?

OR

What is the trend of the human population in Nepal?

3. Describe the structure and function of the spinal cord.
4. Define organ transplantation and discuss its different types.

Group C

Long answer questions.

(8×2 = 16)

5. What are communicable diseases? Discuss the causative agents, symptoms, effects and control measures of any one communicable disease you have studied. 2+2+4 = 8
6. Describe the internal structure of the heart with well labeled diagram. 3+5 = 8

Or

Give an account on the process of urine formation in human . 3+5 = 8

Model Question -4 Biology XII

Time: 3 hrs

F.M. :75

Part I (Botany)

Group A

Circle the correct one from given alternatives

[5×1=5]

1. Fiber , the plant cell, belongs to the
a. Parenchyma b. Sclerenchyma c. collenchyma d. all of above
2. The movement of pollen tube towards embryo sac is
a. Thigmotropism b. Chemotropism c. Geotropism d. Phototropism
3. The first phase in the breakdown of Glucose in the cell is
a. fermentation b. glycolysis c. ETS d. kreb's cycle
4. Heterosis is
a. hybrid vigor b. hybrid incompatibility
c. hybrid sterility d. none of above
5. Drosophila has four homologous chromosomes .What is the number of linkage groups in it ?
a. Four b. Eight c. Two d. Sixteen

Group B

Give short answers to the following questions.

[4×4=16]

1. What do you mean by vernalization? Give its significance . [1+3=4]

OR

Differentiate complete, incomplete and co-dominance .

2. What is anemophily? Give the adaptive features of anemophilous plants with suitable examples. [1+3=4]
3. How is wheat variety produced ?
4. What is tissue ? Describe the one which can divide for life long . [1+3=4]

Group C

Give long answers to the following questions:

[8×2=16]

5. Describe linkage .

Or

What is sex linked gene ? Discuss sex linked inheritance with reference to the one you have studied in mammal. [1+7=8]

6. Name the process by which autotrophs manufacture food for them . Discuss the mechanism of that process that takes place in the grana portion of the chloroplast. [1+7=8]

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives. (6×1=6)

- Ovary and seminiferous tubules are internally lined by
 - sensory epithelium
 - germinal epithelium
 - glandular epithelium
 - ciliated epithelium
- Middle piece of frog sperm possess
 - mitochondria and centriole
 - mitochondria only
 - centriole only
 - nucleus and mitochondria
- The number of spinal nerves in man is
 - 27 pairs
 - 31 pairs
 - 16 pairs
 - 37 pairs
- Adrenaline increases
 - heart beat
 - blood pressure
 - a and b both
 - none of the above
- Which one is an IUCD?
 - condom
 - vasectomy
 - copper T
 - oral pills
- Cornea transplantation is quite common because;
 - it is easily transplanted
 - it does not invite immune response
 - it is easily available
 - doctors are expert

Group B

Give short answers to the following question.

(4×4 = 16)

- Differentiate between cartilage and bones.
- Describe the gastrulation process in frog.

Or

Explain the 'S' shaped and 'J' shaped growth curve.

- Explain the menstrual cycle in women.
- Discuss the advantages and drawbacks of test tube baby.

Group C

Give long answers to the following questions.

(8×2 = 16)

- Describe the causative agents, mode of transmission and control measures of Typhoid. 2+2+4
- Describe the structure and function of the human Ear. 2+3+3

Or

Give an account of the male reproductive organ of human. 3+5

Model Question -5
(Biology XII)

Time: 3 hrs

F.M. :75

Part I (Botany)

Group A

Circle the correct one from the given alternatives.

[5·1=5]

1. is responsible for photolysis of water .
a. Heat b. Light c. Temperature d. None of above
2. An asexually reproducing organism inheriting all the characters of its parent is called
a. off springs b. clone c. hybrid d. variety
3. Water conducting elements of xylem are
a. parenchyma and collenchyma b. vessels and tracheids
c. sieve tubes and companion cell d. all of above
4. Which one of the following is not a method of vegetative propagation?
a. Sowing b. Grafting c. Layering d. Cutting
5. Virus free plants can be obtained from
a. meristem culture b. anther culture c. protoplast culture d. all of above

Group B

Give short answers to the following.

[4·4=16]

1. Which hormone controls tropic movement? Discuss other activities also of that hormone .
2. How does vegetative propagation take place in plants like litchi, pomegranate? Describe the process.
3. Define complex permanent tissues. Describe any one of it of your choice. [1+3=4]
4. Describe gene mutation.

Or

Explain different types of vascular bundles giving examples of each.

Group C

Give long answers to the following questions:

[2·8=16]

5. Define transpiration. Explain types of transpiration .What are the factors affecting rate of transpiration. [1+3+ 4=8]
6. Explain the process of DNA replication as suggested by Watson and Crick. [1+3+4=8]

OR

Give an account on Mendelism.

[8]

Part II (Zoology)

Group A

Circle the correct answer from the given alternatives.

(6·1=6)

1. Cartilage is produced by
a. osteoblasts b. fibroblasts c. epithelium d. chondroblast
2. How many sperms are formed in microsporogenesis?
a. 2 b. 1 c. 3 d. 4
3. Oxytocin hormone is secreted by:
a. adrenal gland b. ovaries c. thyroid gland d. pituitary gland
4. Clitoris in mammals is

- a. homologous to penis.
 - b. analogous to penis.
 - c. functional penis in female.
 - d. non functional penis in male.
5. Cause of global population explosion is
- a. better health care
 - b. increased agricultural products
 - c. more jobs
 - d. fewer wars
6. Vaccines are meant to
- a. prevent the disease.
 - b. cure the disease.
 - c. provide energy.
 - d. all of the above.

Group B

Give short answer to the following questions: **(4×4 = 16)**

1. Give an account of neuron.
2. Write short notes on neurulation.

Or

Give an account for population explosion with its various reasons.

3. What is portal system? Describe the hepatic portal system in human.
4. Describe the measures of family planning.

Group C

Give long answer to the following questions. **(2×8 = 16)**

5. Discuss causative agent, incubation period, affected organs, mode of transmission, symptoms, prevention and control measures of AIDS. 2+2+4 = 8
6. Give an account of the structure of the kidney. 3+5 = 8

Or

Give an account on the structure and working of the human heart. 3+5 = 8

Model Question -6 (Biology XII)

Time: 3 hrs

F.M. :75

Part – I (Botany)

Group A

Multiple choice questions **(5×1=5)**

Attempt all questions

1. Vascular bundles in dicot stem are
 - a. Closed, conjoint, endarch
 - b. Open, conjoint, endarch
 - c. Closed, conjoint, exarch
 - d. Open, conjoint, exarch
2. The outermost and innermost wall layers of microsporangium in an anther are respectively
 - a. epidermis and endothecium
 - b. Middle layer and tapetum
 - c. epidermis and tapetum
 - d. endothecium and tapetum
3. Person having genotype IA and IB would show the blood group as AB. This is because of
 - a. incomplete dominance
 - b. co-dominance
 - c. segregation
 - d. pleiotropy

4. Wilting of a plant is the result of excessive
 - a. absorption
 - b. transpiration
 - c. photosynthesis
 - d. respiration
5. Which of the following growth hormones produces apical dominance?
 - a. Ethylene
 - b. Cytokinin
 - c. Auxin
 - d. Gibberellin

Group B

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

1. How does xylem differ from phloem? Discuss with necessary diagrams. (3+1=4)
2. What do you mean by fertilization? Discuss the process of double fertilization with necessary figures. (1+3=4)
3. Define gene pool. Discuss in detail about different characteristics of genetic code. (1+3=4)
4. Discuss the basic concept of genetic engineering. Explain its practical applications. (1+3=4)

Or

Define mutation. Describe different types of gene mutation with examples. (1+3=4)

Group C

Give long answers to the following questions (2×8=16)

5. List seven traits selected by Mendel for hybridization experiment. Discuss monohybrid cross and the laws that depend upon monohybrid cross. (2+3+3=8)

Or

What are genetic materials? Describe the double helical structure of DNA. List structural differences between DNA and RNA. (1+5+2=8)

6. What do you mean by the ascent of sap? Discuss the most convincing theory associated with it. Also list the factors affecting the process of ascent of sap. (1+5+2=8)

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives (6×1 = 6)

1. Which of the following tissues consists of actively dividing cells?
 - a. Epithelial tissue
 - b. Connective tissue
 - c. Muscular tissue
 - d. Nervous tissue
2. A primary oocyte gives rise to ovum/ova in frogs.
 - a. one
 - b. two
 - c. four
 - d. many
3. Enzyme responsible for digestion of milk protein is
 - a. casein
 - b. rennin
 - c. pepsin
 - d. lactase
4. The pacemaker of human heart is
 - a. SA node
 - b. AV node
 - c. both a and b
 - d. bundle of His
5. Stimulants are the drugs that temporarily tend to increase mental alertness and self-confidence. Which one of the following is not a stimulant?
 - a. cocaine
 - b. caffeine
 - c. tranquilizers
 - d. amphetamines
6. Keratoplasty is quite common because
 - a. it is easily available
 - b. it doesn't invite immune response
 - c. it can be easily transplanted
 - d. it can be preserved for a long time

Group B

Give short answers to the following questions.

(4·4 = 16)

1. Cartilage and bones both support the body and come under skeletal connective tissue. Mention the differences between these two types of tissues. (3+1)
2. Fertilization involves fusion of sperm and ovum to form zygote. Explain how it occurs in frog. (2.5+1.5)

Or

- Define organ transplantation and discuss its different types. (1+3)
3. Explain the working mechanism of the human heart with necessary diagram. (2.5+1.5)
 4. Write a short note on renal disorders. (2+1+1)

Group C

Give long answers to the following questions

(2·8 = 16)

5. Describe the structure and function of the human brain with well labeled diagram.

Or

(3+3+2)

Describe the mechanism of urine formation in human.

(5+3)

6. What is AIDS? Mention its causative organism, mode of transmission, symptoms, diagnosis, treatment and preventive measures. (1+1+2+2+0.5+0.5+1)

Model Question -7 (Biology XII)

Time: 3 hrs

F.M. :75

Part –I (Botany)

Group A

Circle the correct answer from the given alternatives.

(5x1=5)

Attempt all questions

1. Casparian strips are found in
 - a. epidermis
 - b. endodermis
 - c. exodermis
 - d. pericycle
2. The stalk of the ovule is called
 - a. funicle
 - b. micropyle
 - c. chalaza
 - d. nucellus
3. What is the name of the process by which turgidity of a cell is maintained?
 - a. wall pressure
 - b. osmotic pressure
 - c. diffusion pressure
 - d. turgor pressure
4. Cross between F1 heterozygotes with the recessive parent is called
 - a. back cross
 - b. out cross
 - c. test cross
 - d. monohybrid cross
5. What is callus ?
 - a. tissue that grows to form an embryoid
 - a. an unorganized actively dividing mass of cells
 - b. an insoluble carbohydrate
 - c. a tissue that grows from an embryo

Group B

Give short answers to the following questions.

(4×4=16)

1. Describe the mechanism responsible for the formation of monocot embryos in angiosperms. Give an example of any two species belonging to monocot. (3+1=4)
2. Describe the role of the vascular bundle. Differentiate between open and closed vascular bundles. (1+3=4)
3. Describe the process of crossing over and its significance. (3+1=4)
4. What do you mean by bio-fertilizer? Mention about green manure. (2+2=4)

Or

Define linkage. Describe in detail about the complete linkage with an example. (1+3=4)

Group C

Give long answers to the following questions

(2×8=16)

5. What are the criteria for selecting pea plants for the hybridization experiment by Mendel? When a cross is made between red flower and white flower pea plants, what proportions of phenotype in the offspring could be expected to be in F₂ generation. What will be the effect on the monohybrid ratio? (2+4+2=8)

Or

Define sex linked inheritance. Discuss it with special reference to eye color of *Drosophila melanogaster*. (1+4+3=8)

6. Define respiration. Describe the mechanism of aerobic respiration that occurs in mitochondria. (1+4+3=8)

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives.

(6×1 = 6)

1. Myelin sheath in CNS is formed by
a. astrocytes b. microglia c. oligodendrocytes d. schwann cells
2. In telolecithal eggs, yolk is present
a. throughout the egg b. at the center c. at opposite side d. at one pole
3. The number of lobes in liver and lungs of human are respectively
a. 3 and 2 b. 4 and 5 c. 5 and 4 d. 3 and 5
4. HCl of the gastric juice
a. inactivates ptylin and activates pepsin b. activates ptyalin and inactivates pepsin
c. inactivates both ptyalin and pepsin d. activates both ptyalin and pepsin
5. COPD is caused by
a. smoking b. alcoholism c. drug abuse d. AIDS
6. All are true for IVF except
a. It is available in our country.
b. It is done through an external fertilization process.
c. Surrogate mother is involved.
d. Multiple eggs are collected during this process.

Discuss different stages of development of microgametogenesis with necessary diagrams.(2+2=4)

Group C

Give long answers to the following questions. (2·8=16)

5. Define genetic material. Describe the process involved in the semi-conservative mode of replication of DNA with necessary neat and clean diagrams. (1+4+3=8)

Or

Who is the father of Genetics? What does it mean by dihybrid cross? Explain the Law of Independent Assortment. (1+2+5=8)

6. What is photosynthesis? Describe the light dependent steps of photosynthesis. How are they linked to the dark reaction? Discuss. (1+6+1=8)

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives (6x1 = 6)

- Which of the following is the most abundant leukocyte?
a. acidophil b. neutrophil c. monocyte d. lymphocyte
- Blastopore is present during
a. cleavage b. morula c. blastula d. gastrula
- Ceruminous glands are present in
a. skin b. eye-lids
c. external auditory meatus d. Vagina of female
- Reasoning power is maximum in human due to the development of
a. cerebral cortex b. midbrain c. cerebellum d. medulla
- All the mentioned drugs are Hallucinogens except for
a. bhang b. heroin c. LSD d. charas
- The principal microorganism for yogurt is
a. *Streptococcus thermophilus* b. *Streptococcus lactis*
c. *Lactobacillus acidophilus* d. *Saccharomyces*

Group B

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

- Bone is a hard skeletal connective tissue. Describe the structure of compact bone in detail with necessary diagram. (2+2)
- Explain the process of spermatogenesis in frog with required diagram. (2+2)

Or

Write down the advantages of fish farming. Also mention two examples, one each of endemic and exotic fishes. (3+1)

- Explain the changes that occur in ovaries and uterus of females during the menstrual cycle. (2+2)
- Write a short note on some respiratory disorders.

Group C

Give long answers to the following questions.

(2·8 = 16)

5. Describe the anatomy of the human heart with diagram.

(5+3)

Or

Explain the physiology of respiration in human.

(2+2+2+2)

6. What are communicable diseases? Describe the causative agent, symptoms, effects and control measures of any one communicable disease you have studied. (1+1+2+2+2)

Model Question -9

(Biology XII)

Time: 3 hrs

F.M. :75

Part: I (Botany)

Group A

Circle the correct answer from the given alternatives.

(5 · 1 = 5)

- Wooden doors swell up and get stuck up during rainy season due to
a. endosmosis b. exosmosis c. imbibition d. capillarity
- A yellow seeded pea plant is crossed with a green seeded pea plant. The offsprings in F₁ generation shall be
a. all yellow b. all green c. 3 yellow : 1 green d. 3 green : 1 yellow
- Drooping of Mimosa (touch-me-not) upon touching is an example of
a. thigmotropism b. seismonasty c. nyctinasty d. chemonasty
- One of the following is not true.
a. Entomophilous flowers have sticky rough pollen grains.
b. Triple fusion in Angiosperms is essential for formation of endosperm.
c. Secondary growth occurs in all dicot plants.
d. Full form of rDNA is ribosomal deoxyribonucleic acid.
- A young legume ploughed back in the soil produces
a. farmyard manure b. composite manure c. green manure d. biofertilizer

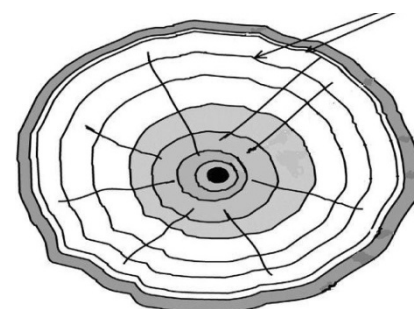
Group B (Botany)

Give short answers to the following questions.

(4 · 4 = 16)

- What do you mean by vegetative reproduction? Discuss its significance. (1+3)
- What are linked genes? Describe the incomplete linkage in maize. (1+4)
- Define genetic engineering. In what way could it be harmful? (1+4=4)
- What is genetic code? Discuss its characteristics. (1+4=4)

OR



- i. What is this diagram about?

- ii. Draw the diagram and label.
- iii. Name the tissues responsible for the process and give the reason if it could happen in monocots. (1+1+1+1=4)

Group C

5. Eye color in *Drosophila* is a sex linked trait. What does it mean? Describe the mechanism of inheritance of eye color in *Drosophila*. (1+ 4+3)

Or

Define replication of DNA. Describe the semi-conservative mode of DNA replication with necessary diagrams. (1+3+4)

6. Calvin cycle of photosynthesis consists of three distinct phases. What are those? Explain each. Show it in graphic representation. And give the significance of each phase. (1+5+2)

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives (6x1 = 6)

1. The phagocytic cell present in human blood is
a. acidophil b. basophil c. neutrophil d. lymphocyte
2. Grey crescent is present in
a. secondary oocyte b. zygote c. spermatid d. ovum
3. In nephron, there is complete absorption of
a. urea b. Salt c. water d. glucose
4. Swallowed food doesn't enter windpipe due to structure called
a. uvula b. epiglottis c. diaphragm d. larynx
5. Which of the following is a stimulant?
a. Alcohol b. heroin c. morphine d. caffeine
6. Vaccines are available for all the diseases except for
a. typhoid b. cholera c. ascariasis d. tuberculosis

Group B

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

1. Describe the structure of multipolar myelinated neurons with diagram. (2+2)
2. Explain how segmentation occurs during development of frog. (2+2)

Or

Define amniocentesis. Mention its merits and demerits. (0.5+2.5+1)

3. Describe the structure and function of digestive gland pancreas. (3+1)
4. Mention the causes, effects and control measures of alcoholism. (1+2+1)

Group C

Give long answers to the following questions (2x8 = 16)

5. Describe the structure and function of the human eye with a well labeled diagram. (5+3)

Or

Justify pituitary gland as master gland. (1+5+2)

6. Discuss the causative agent, mode of transmission, symptoms, control and prevention of Cholera in the context of Nepal. (1+2+2+3)

Model Question -10
(Biology XII)

Time: 3 hrs

F.M. :75

Attempt all questions

Part: I (Botany)
Group A

Circle the correct answer from the given alternatives.

(5x1=5)

1. A woman has a child with Klinefelter's syndrome. His chromosomal constitution is
a. 44 + X b. 44 + Y c. 44 + XXY d. 44 + XYY
2. Stock and scion are connected with
a. breeding b. grafting c. emasculation d. micropropagation
3. Monocot stems are anatomically characterized by
a. scattered vascular bundles b. sclerenchymatous hypodermis
b. conjoint closed bundles d. all of these
4. Principal micro-organism involved in formation of yogurt is
a. *Streptococcus thermophilus* b. *Lactobacillus acidophilus*
b. *Streptococcus lactis* d. *Leuconostoc citrovorum*
5. One of the following groups consists of the termination codons.
a. UUU, UUA and UUG b. UUA, UUG and UUC
b. UUA, UAG and UGA d. UAA, UGG and UCC

Group B

Give short answers to the following questions.

(4 · 4 = 16)

1. What do you mean by criss-cross inheritance? Show it in the case of human with a suitable example. (1 + 3 = 4)
2. Fermentation has many important uses in industries. Discuss some of them. (4)
3. Describe the process of dicot embryogeny with labelled diagrams. (2+2=4)
4. How do you differentiate anatomically dorsiventral leaves from isobilateral leaves? (2+2=4)

OR

Modern wheat *Triticum aestivum* is an allohexaploid (6n). How do you agree with this statement? (2+2=4)

Group C

Give long answers to the following questions.

(2·8 =16)

5. What do you mean by dihybrid cross? Explain with suitable example, Mendel's principle of Independent Assortment with the help of a dihybrid cross. Give two reasons for his success. (1+ 5+2)

Or

What are the components of deoxyribonucleic acid? Describe the double helical structure of DNA. Give its functions also. (2+ 4+2)

6. Aerobic respiration completes in four phases. What are these? Describe the mechanism of respiration that occurs in mitochondria.

Part – II (Zoology)

Group A

Circle the correct answer from the given alternatives.

(6•1 = 6)

- Neuroglia are non-conduction accessory cells of nervous tissue. The neuroglia which lines the brain ventricles are
a. microglia b. oligodendrocytes c. Schwann cells d. ependymal cells
- The cleavage found in frog is
a. meroblastic b. holoblastic c. vertical d. horizontal
- Enzyme responsible for digestion of milk sugar is
a. casein b. rennin c. pepsin d. lactase
- The amount of blood pumped by heart in one minute is
a. tidal volume b. cardiac volume c. stroke volume d. cardiac output
- The disorder related with liver due to alcoholism is
a. cirrhosis b. emphysema c. arrhythmia d. stenosis
- The major group of cells depleted in AIDS is
a. helper T cells b. macrophages c. monocytes d. killer T cells

Group 'B'

Give short answers to the following questions.

(4•4 = 16)

- Areolar tissue is the most common type of connective tissue. Describe the structure and function of areolar tissue. (3+1)
- Neurulation is the process of formation of neural tubes. Explain in detail the process of formation of it. (2+2)

Or

Write a short note on IVF. (1+2+1)

- Explain the mechanism of pulmonary ventilation with necessary diagram. (2.5+1.5)

4. Give the meaning of drug abuse and write the causes and consequences of drug abuse. (0.5+1+2.5)

Group 'C'

Give long answers to the following questions. (2·8 = 16)

5. Describe the structure and function of human female reproductive organs with a well labeled diagram. (5+3)

Or

Describe the respiratory organs of humans with necessary diagram. (5+3)

6. What is influenza? Mention its causative organism, mode of transmission, symptoms, diagnosis, treatment and preventive measures. (1+1+2+2+0.5+0.5+1)