HISSAN CENTRAL EXAMINATION – 2079 (2022)

Grade: XII **F.M.: 75**

Time: 3 hrs

Biology (2021 – D3)

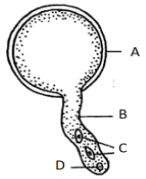
The figures in the margin indicate full marks.
Attempt **all** the questions as instructed.

PART: I (Botany)

GROUP A

Circle the correct answer from the given alternatives. **[5 × 1 = 5]**

1. Open type of vascular bundles in plants is characterized by
   a. Presence of xylem and phloem as separate patches
   b. Absence of cambium between xylem and phloem
   c. Presence of fascicular cambium between xylem and phloem
   d. Xylem and phloem bundles arranged in ring
2. Under which condition is water lost from plants through guttation?
   a. Humid and warm atmosphere
   b. Rainy day
   c. When all stomata are closed
   d. When the day is sunny and windy
3. Which of the following statements is true with respect to Deoxyribonucleic acid (DNA)?
   a. Genetic codes are the set of nucleotides present in DNA
   d. DNA is a genetic materials of all the living beings
   c. DNA has capacity for its self-replication
   d. All above
4. In the adjacent figure, which letter represents male gamete?
   a. A
   b. B
   c. C
   d. D



5. *Bacillus thuringiensis* is playing important role for increasing crop production. What role does this organism play?
   a. Bio-fertilizer
   b. Bio-pesticide
   c. Bio-fungicide
   d. Bio-herbicide

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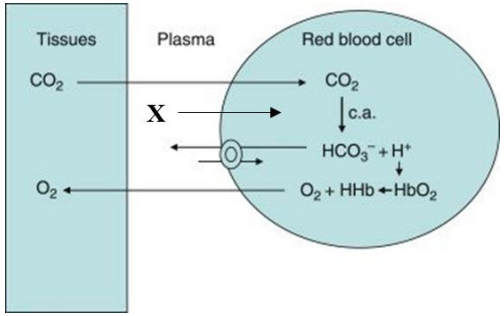
PART: II (Zoology)

GROUP A

Circle the correct answer from the given alternatives. **[6 × 1 = 6]**

1. Which of the following is the difference between a nerve and a neuron?
   a. Consists of different number of cells
   b. One has motor and other has sensory function
   c. Nerves are made of grey matter while neurons of white matter
   d. Nerves are present in central nervous system only
2. At the end of spermatogenesis each primary spermatocyte gives rise to
   a. Only one spermatid
   b. Two spermatids
   c. Three spermatids
   d. Four spermatids
3. Hormones responsible for "fight-or-flight" responses are
   a. Thyroxine and melatonin
   b. Insulin and glucagon
   c. Epinephrine and norepinephrine
   d. Oestrogen and progesterone
4. The diagram below shows Hamburger phenomenon. Which of the following in the correct label for X?



   a. O_2
   b. HCO_3^-
   c. Cl^-
   d. CO_2
5. In the ABO system, blood group 'O' is characterized by the
   a. Presence of antigen O
   b. Presence of both antigen A and antigen B
   c. Absence of both antigen A and antigen B
   d. Presence of antigen A and absence of antigen B
6. Which part of nephron reabsorbs maximum amount of electrolytes and water (about 70-80%) from the glomerular filtrate?
   a. Proximal convoluted tubule
   b. Ascending limb of loop of Henle
   c. Descending limb of loop of Henle
   d. Distal convoluted tubule

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Grade: XII **F.M.: 75**

Time: 3 hrs

Biology (2021 – D3)

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.
Use separate answer sheet for Botany and Zoology.
Attempt **all** the questions as instructed.

PART: I (Botany)

GROUP B

Give short answer to the following questions. **[4 × 4 = 16]**

1. Draw a well-labelled diagram of dicot root. Mention two distinguishing anatomical features of the dicot root. **[3+1]**

2. When one leaf of a plant is exposed to monochromatic light of 680 nm wavelength and another leaf to the monochromatic light of 700 nm wavelength, how do photosynthetic process differ in these two leaves? Explain. **[4]**

3. In some polyploidy organisms, chromosomes are derived from different species. Explain such polyploidy with suitable example. **[4]**

4. Explain the process of female gametophyte development in angiosperm with suitable diagrams. **[2+2]**

OR

What is hybridization? Explain the steps of hybridization process in plants. **[1+3]**

GROUP C

Give long answer to the following questions **[2 × 8 = 16]**

5. How the presence or absence of oxygen affect the respiratory process? Give a flowchart illustrating Krebs cycle [Explanation not needed]. **[4+4]**

6. What is Linkage? Explain Complete and Incomplete linkage with suitable examples. **[1+7]**

OR

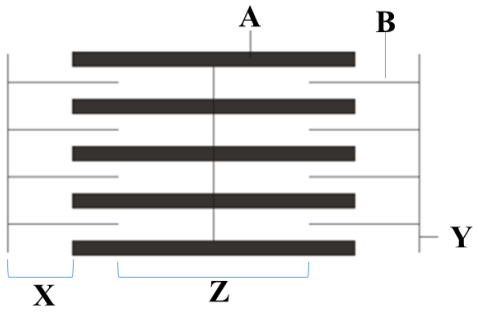
Explain the Mendel's law of Independent Assortment with suitable hybridization experiment. Under which condition is this law not applicable? **[7+1]**

PART: II (Zoology)

GROUP B

Give short answers to the following questions. **[4 × 4 = 16]**

1. The diagram below shows a sarcomere from a myofibril of a striated muscle fibre. Define sarcomere. Name the regions labeled as X, Y, Z. Name the materials which make up A and B. **[1+2+1]**



2. What is gastrulation? Describe the process of gastrulation during the development of frog. **[1+3]**

OR

Briefly explain different fish farming practices in Nepal. **[4]**

3. Differentiate between J-shaped and S-shaped curves of population growth. **[2+2]**

4. Discuss the mechanism of protein digestion in human alimentary canal. **[4]**

GROUP C

Give long answers to the following questions. **[2 × 8 = 16]**

5. Typhoid fever is a life threatening bacterial infection. Name the causative agent of typhoid. Give symptoms, preventive and control measures of typhoid. Suggest how can its risk be minimized in Nepal. **[1+2+2+2+1]**

6. Describe the structure and function of human brain. **[6+2]**

OR

With the help of well-labeled diagram, briefly explain female reproductive organs of human. Write short note on stages of menstrual cycle. **[2+3+3]**

THE END