

**NEB - GRADE XII
2083(2026)**

Biology

(For regular and partial general stream's students whose first two digits of registration number starts from 79, 80, 81 and 82)

**Please complete first section I (Botany) and then section II (Zoology).
Answer of each section should be separated in the same answer sheet.**

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

**Section : I (Botany)
Multiple Choice Questions
Group 'A'**

Rewrite the correct option of each question in your answer sheet. [5×1=5]

1. What is the specific term used for the part of the plant that provides the root system?
A) Propagule B) Stock C) Callus D) Scion
2. What is called the process in which the shrinkage of protoplasm of fresh plant cell kept in hypertonic solution?
A) Deplasmolysis B) Endosmosis C) Imbibition D) Plasmolysis
3. Which of the following tissue of a leaf helps in photosynthesis?
A) Aerenchyma B) Xylem C) Mesophyll D) Sclerenchyma
4. Which of the following describes the transmission of an X-linked trait from a father to his grandson through his normal carrier daughter?
A) Co-dominance B) Maternal inheritance
C) Y-Linked inheritance D) Criss-cross inheritance
5. A gardener removes the apical bud of a coffee plant to promote lateral branching. Which hormonal change best explains this effect?
A) Reduced auxins allows lateral buds to grow
B) Increased gibberellin causes stem elongation
C) Increased auxin induces dormancy
D) Increased auxins stimulates lateral buds

Section : II (Zoology)
Multiple Choice Questions
Group 'A'

Rewrite the correct option of each question in your answer sheet. [6×1=6]

12. Tendons connect muscles to bones. Why are they less elastic in nature?
A) They contain more elastin fibres
 B) They contain more collagen fibres
C) They contain less collagen fibres
D) They contain more reticular fibres
13. What is the space between the somatic and visceral layer of mesoderm called in the embryonic development of frog?
A) Blastocoel
 C) Coelom
B) Archenteron
D) Neurocoel
14. A 17-year old student can read books comfortably but cannot clearly see the letters on black or white board. What could be the defect and its cause?
A) Hypermetropia due to short eyeball
B) Myopia due to increased focal length
 C) Myopia due to elongated eyeball
D) Presbyopia due to weak ciliary muscles
15. Coronary sinus collect deoxygenated blood from myocardium (muscles) of heart. It drains blood into which chamber?
A) Left atrium B) Right atrium C) Left ventricle D) Right ventricle
16. Which of the following are psychotropic drugs?
A) Opiates B) Antihistamines C) Mescaline D) Bhang
17. Which vaccine is prepared using DNA-recombinant technology and contains only a specific antigen, reducing adverse reactions ?
A) BCG B) OPV C) Hepatitis B D) Rabies

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Time: 3 hrs.

Full Marks: 75

Group 'A' (Botany and Zoology)

[11×1=11]

Question No. 1 to 5 (Group A Botany) and Question No 12 to 17 (Group A Zoology) Multiple Choice Questions will be provided after 30 minutes of starting examination. Rewrite its (MCQ) correct options (answer) in your same answer sheet.

Section : I (Botany)

Attempt all the questions.

Group 'B'

Short answer questions.

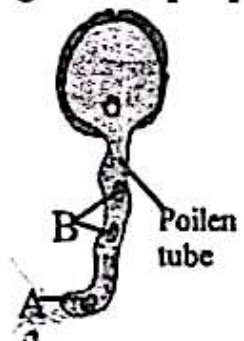
[4×4=16]

6. Describe the internal structure of a monocot root with diagrammatic figure. [3+1]

7. Study the given figure and answer the following questions.

i) Identify the given figure and name the parts label by A and B. [1.5]

ii) Explain the development of this structure from a microspore with the help of labelled diagrams. [2.5]



8. A plant species has $2n=14$ chromosomes. A mutant plant is found to have $2n+1(15)$ chromosomes. Identify the type of chromosomal mutation and, on this basis, differentiate between aneuploidy and euploidy. [1+3]

OR

Glycolysis involves partial oxidation of glucose to pyruvate with release of energy. Write the flow chart of major phases of EMP pathway and state the net gain of ATP and NADH per molecule of glucose in it. [3+1]

9. Although plant tissue culture has the potential to reduce global hunger, it is often considered expensive for developing countries. Briefly analyze its limitations and suggest some suitable measures for effective implementation in Nepal. [2+2]

(Contd...)

Group 'C'

Long answer questions.

[2×8=16]

10. Dark reaction or Black man's reaction of photosynthesis occurs in absence of light inside stroma region of chloroplast. It uses ATP and NADP and reduce to CO_2 to form sugar. Provide the flow chart for C_3 Cycle highlighting 3 major steps, and explain it. Write the chemical equation of photosynthesis. [4+3+1]
11. 'DNA is known as the universal genetic material, where as RNA is not'. Justify this statement. Describe DNA with reference to its chemical composition, Watson and Crick's model with labelled diagram and function. [2+1+4+1]

OR

Describe the process of crossing over during prophase - I of Meiosis - I with the help of labelled diagrams. Explain how the absence of crossing over would affect genetic variation of offspring. [6+2]

Section : II (Zoology)

Group 'B'

Short answer questions.

[4×4=16]

18. Compare and contrast bone and cartilage. [2+2]
19. Describe the process of oogenesis, with the help of schematic diagram. [3+1]

OR

Discuss the advantages and disadvantages of organ transplantation. [2+2]

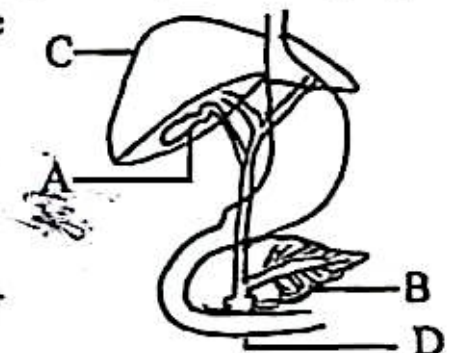
20. Study the given figure carefully and answer the following questions.

i) Label the parts A and B . [1]

ii) Why is part B called mixed gland? [1]

iii) What is the function of part A and C ? [1]

iv) Name the sphincter located at the Ampulla of Vater or hepato-pancreatic ampulla. [1]



21. Respiratory disorders occur when there is problem in any part of the respiratory system. Identify any four respiratory disorders prevalent in your community. Also, suggest some methods of prevention. [2+2]

(5)

2021 'P'

Group 'C'

Long answer questions.

[2×8=16]

22. Candidiasis also known as moniliasis is an infection which affect immune compromised people. Describe its causative agent, mode of transmission, symptoms and preventive measures. Why is candidiasis common in diabetic patients? [1+2+2+2+1]
23. Sympathetic and parasympathetic nervous system have opposing functions and controls involuntary activities of the body. Differentiate between sympathetic and parasympathetic nervous system. Draw a well labelled diagram of human brain and give short account on brain ventricles.

[3+3+2]

OR

Adrenal glands also known as suprarenals are located above the kidneys and have outer cortex and inner medulla region. Name the different groups of hormones secreted by the different regions of adrenal cortex. Mention specific functions of each. Describe the disorders of hormones secreted by adrenal cortex. [1.5+3+3.5]