

NEB-XII

2079 (2023)

Model question

Biology

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

Time: 3 hrs.**Full marks: 75**Attempt **all** the questions.**Section: I (Botany)****Group 'A'****Rewrite the correct options of each question in your answer sheet.****5x1=5**

1. What type of development of an embryo from an unfertilized egg is called?
A) Parthenocarp
B) Parthenogenesis
C) Polyembryogeny
D) Polycarpy
2. Which one of the following parts is responsible for transpiration in plants?
A) Root
B) Stem
C) Leaves
D) All aerial parts
3. Which type of mutation is caused by the addition or deletion of a single nitrogenous base?
A) Transition
B) Transversion
C) Frame shift
D) Substitution
4. What basis would you apply to distinguish a meristematic tissue from a permanent tissue?
A) Supporting plant
B) Providing food
C) Activating cell division
D) Losing ability of cell division
5. Some of the C₄ plants possess diagnostic features of Kranz anatomy. Select which of the following plant contains such features?
A) Wheat
B) Maize
C) Barley
D) Sugarcane

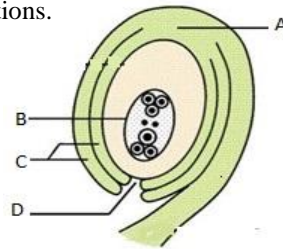
Group 'B'**Give short answer to the following questions.****4x4=16**

6. Define vascular bundle. What type of vascular bundle is present in monocot root? Mention any two functions of vascular bundle. (1+1+2)

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

(1+2+1)

- i. Identify the given figure.
- ii. Name the parts A to D.
- iii. State the function of part D.



8. If you are assigned to make a Watson and Crick model of DNA, what essential components do you apply to make the exact structure of the DNA. (2+2)

OR

Assuming you are provided seeds for germination, which influencing parameters you need to follow for normal germination? What would happen when seeds are kept in low temperature? (3+1)

9. Biotechnology is an emerging discipline in this era. Would you think can it be used to mitigate the problem of food scarcity in context to Nepal? Justify your opinion. (4)

Group 'C'

Long answer questions.

2x8=16

10. Three German biochemists Embden, Meyerhof and Paranas (EMP) worked out a pathway which involved the formation of pyruvic acids from a glucose molecule. Identify this pathway. Name the site where this pathway takes place in a cell. Construct a step by step pathway developed by them. List the net gain of ATP in this pathway. (1+1+5+1)

11. Semi conservative mode of DNA replication is the most common mode of replication which results in two identical daughter DNA molecules. Explain various enzymes and mechanism involved during this process with necessary diagrams. (2+4+2)

OR

“Genes are inherited in new combination due to crossing over in the gametes”. Interpret this statement with its mechanism and necessary diagrams. Assess its significance also. (4+2+2)

Section: II (Zoology)

Group 'A'

6x1=6

12. Which of the following tissue lacks blood supply?
- A) Areolar
 - B) Muscular
 - C) Bone
 - D) Cartilage
13. In frog, coelom is derived from which embryonic layer?
- A) Ectoderm
 - B) Mesoderm
 - C) Endoderm
 - D) Mesogloea
14. What kind of enzyme is needed for digestion of milk protein in human beings?
- A) Rennin
 - B) Lactase
 - C) Pepsin
 - D) Sucrase
15. Which one of the following sets contains the bacterial disease only?
- A) Hepatitis, influenza, cholera
 - B) Cholera, typhoid, candidiasis
 - C) Tuberculosis, typhoid, cholera
 - D) Tuberculosis, cholera, candidiasis
16. If the cerebellum of a person gets injured, it will have effect on which of the following physiological function?
- A) respiratory ability.
 - B) body movement
 - C) memory function
 - D) smelling power

17. Vas deferens transport spermatozoa from cauda epididymis to ejaculatory duct. What happens when the vas deferens of a male is surgically disconnected?

- A) Sperms become non-motile
- B) Sperms lack nuclei
- C) Seminal fluid is without sperms
- D) No spermatogenesis occurs

Group 'B'

Give short answer to the following questions.

4x4=16

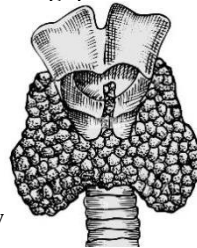
18. Define blastulation. Write down the process of blastulation during the development of frog. (1+3)

OR

What is immunity? Explain its type. (1+3)

19. Study the given figure carefully and answer the following questions. (1+1+2)

- i. Identify the gland.
- ii. Where is it located?
- iii. Mention any two hormones secreted by it.



20. Compare and contrast areolar and adipose connectiv (2+2)

21. Peer pressure plays a negative role in provoking smoking habits in adolescents. As a school captain, plan any two activities you would like to organize with the help of senior students and any other two activities you would like your school authorities to organize for the students to tackle this problem. (2+2)

Group 'C'

Give long answer to the following questions.

(2x8=16)

22. Why typhoid is called enteric fever? Illustrate its causative agent, mode of transmission, symptoms and preventive measures. (1+1+2+2+2)

23. A human being usually take complex foods in her/his diet. However, our body needs its simpler form. Describe how the complex foods are converted into simpler forms within alimentary canal. Draw it with a well labeled diagram of alimentary canal. What would happen in digestion if the gall bladder is removed surgically? (4+ 2+ 2)

OR

On oxidation of glucose in the cells, CO₂ is released as a by-product. This CO₂ is carried to the lungs for elimination. Explain how the transport of CO₂ take place in human body? What is the role of carbonic anhydrase enzyme? Mention the significance of diaphragm in breathing? (5+1+2)