A

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Summative Assessment - Term I 2025-26

E-1006-BIO

Class : X

BIOLOGY

Time : 1½ Hours
Score : 40

Instructions

1. First 15 minutes is given as cool off time. You may use the time to read the questions and plan your answers.
2. Read the questions carefully and answer the questions.
3. Keep in mind the score and time while answering the questions.
4. Choices are given for questions 5, 10, 13, 16, and 18.

Answer questions from 1 to 4. Each carries 1 Score. **(4×1=4)**

1. Identify the cells, comprising more than half of the brain and spinal cord that has the ability to divide but cannot transmit impulses. (1)

i) Neurons ii) Neuroglial cells
iii) WBC iv) Muscular cells

a) i and ii b) i and iii c) i only d) ii only

2. Which of the following is the correct arrangement of components of RNA nucleotide? (1)

i) Phosphate - Ribose - Uracil
ii) Adenine - Phosphate - Ribose
iii) Ribose - Phosphate - Cytosine
iv) Phosphate - Ribose - Guanine

a) i, ii b) i, iv c) ii, iii, iv d) iii, iv

3. Match **Column I** with **Column II** and choose the correct combination. (1)

I. Type of inheritance	II. Characteristic feature
P. Multiple Allelism	1. More than one gene controls a trait.
Q. Polygenic Inheritance	2. A single gene with more than two alleles controls a trait.
R. Mendelian Inheritance	3. Trait expression is governed by a single pair of alleles.

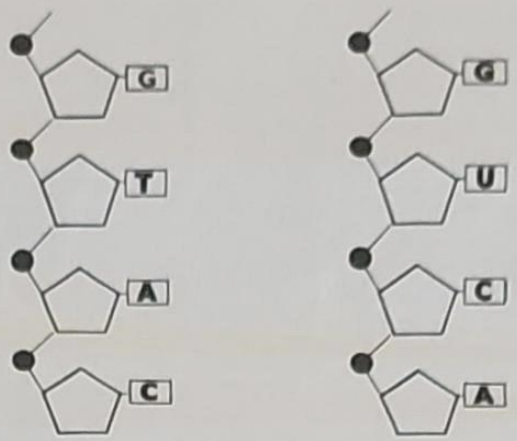
a) P-3, Q-2, R-1 b) P-1, Q-2, R-3
c) P-2, Q-3, R-1 d) P-2, Q-1, R-3

4. Due to antibiotic resistance, antibiotic treatment was ineffective in a patient. Which genetic change in the bacteria caused this? (1)

a) Over production b) Mutations c) Translation d) Speciation

Answer questions from 5 to 11. Each carries 2 Score. **(7×2=14)**

5. A) Observe the illustration of nucleic acid strands and answer the questions.



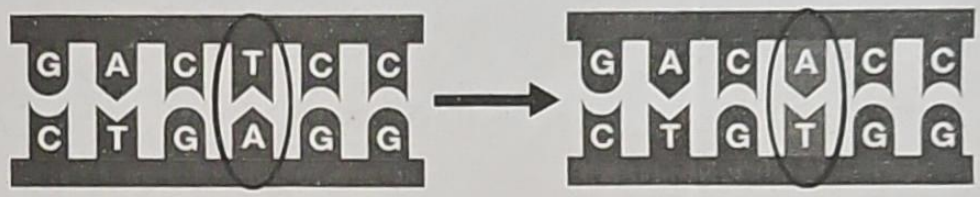
P **Q**

a) Which one is the strand of DNA? Why? (1)

b) Write the nitrogen bases in this strand and pair them with their complementary bases. (1)

OR

B) Observe the illustration related to a process causing variation and answer the questions.



a) Write any two causes of the process illustrated. (1)

b) This process plays a major role in evolution. How? (1)

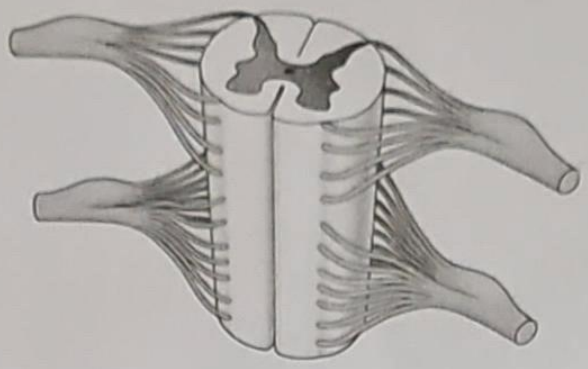
6. Read the statement and answer the questions.

Synapses transmit nerve impulses between neurons and regulate their direction and speed.

a) Identify the chemical substance involved here. (1)

b) Explain how the unidirectional transmission of impulses at a synapse is ensured. (1)

7. Observe the illustration and answer the questions.



a) Identify the part illustrated and write how it is protected? (1)

b) Based on its function, explain how damage to it affects the body? (1)

8. Explain DNA packaging in a cell with necessary additions to the given information. (2)

Histone Octamer	Chromosome	Histone

9. Neo-Darwinism addressed limitations in Darwin's theory by incorporating new scientific discoveries.

a) What was the limitation? (1)

b) How did the concepts about genes and chromosomes help to overcome this limitation? (1)

10. A) The fossil of Archaeopteryx is a milestone in evolutionary studies.

a) What evidence does it provide for supporting evolution? (1)

b) Mention another evidence from fossil studies. (1)

OR

B) One of the factors that influenced Charles Darwin to formulate the theory of evolution was diversity in the beaks of finches on Galapagos Islands.

How did this variation help in the development of new species of finches? (2)

11. Read the statement and answer the questions.

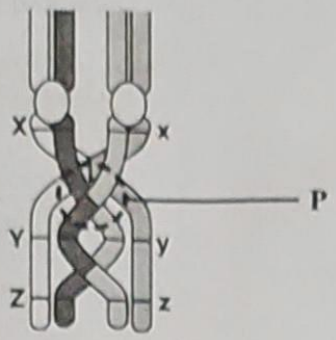
The cerebral cortex of the human brain is modified into a complex neocortex.

a) Write any two advanced mental processes enabled by this brain development. (1)

b) Imagine a person stops learning new things. How would this affect their neocortex over time? Justify your answer. (1)

Answer questions from 12 to 17. Each carries 3 Score. **(6×3=18)**

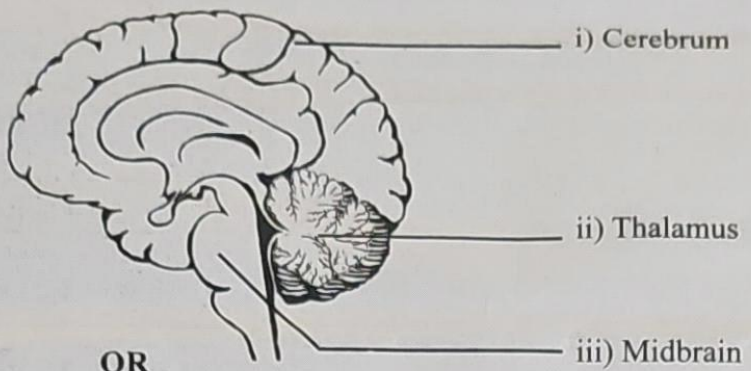
12. Observe the illustration and answer the questions.



a) Identify 'P' and write how is it formed? (1)

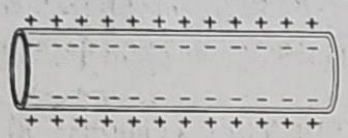
b) How does the subsequent process lead to variation? (2)

13. A) Redraw the diagram. Label the parts correctly if there is any mistake and write their function. (3)

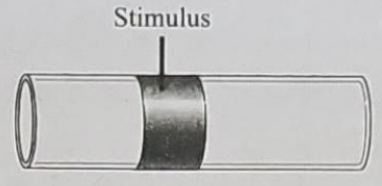


OR

B) Observe the illustrations and answer the questions.



X- Before stimulation



Y- Stimulated neuron

a) Draw illustration 'Y' including the distribution of charges. (1)

b) How does this change help in the transmission of impulses? (2)

14. Analyse the situations and answer the questions.

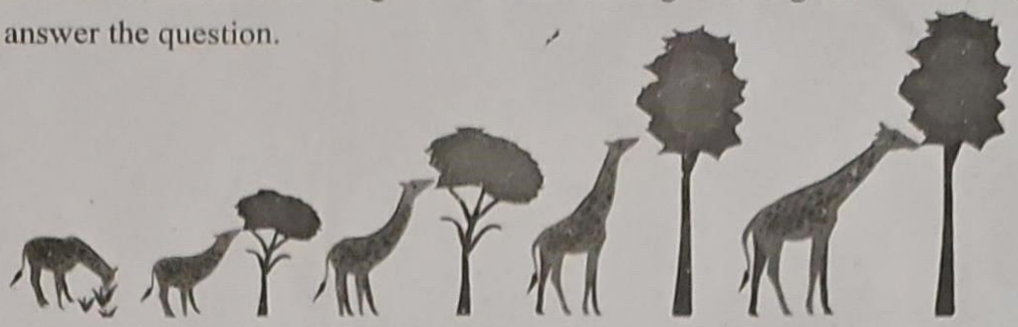
Observation of farmer :

- Red × White flowers → Pink flowers
- Black × White cattle → Offspring with roan coat

a) Identify the specific patterns of inheritance demonstrated in the plant and the cattle respectively. (1)

b) Differentiate between these two patterns of inheritance. (2)

15. Observe the illustration showing the evolution of long necked giraffes according to Lamarck and answer the question.



Explain this on the basis of Darwin's theory of natural selection. (3)

16. A) Analyse the statement and answer the questions.

Human beings have 23 pairs of chromosomes of which one set is inherited from mother and other from the father.

a) How can you classify these chromosomes based on function? (1)

b) Is the 23rd pair of chromosome same in all individuals. Explain? (2)

OR

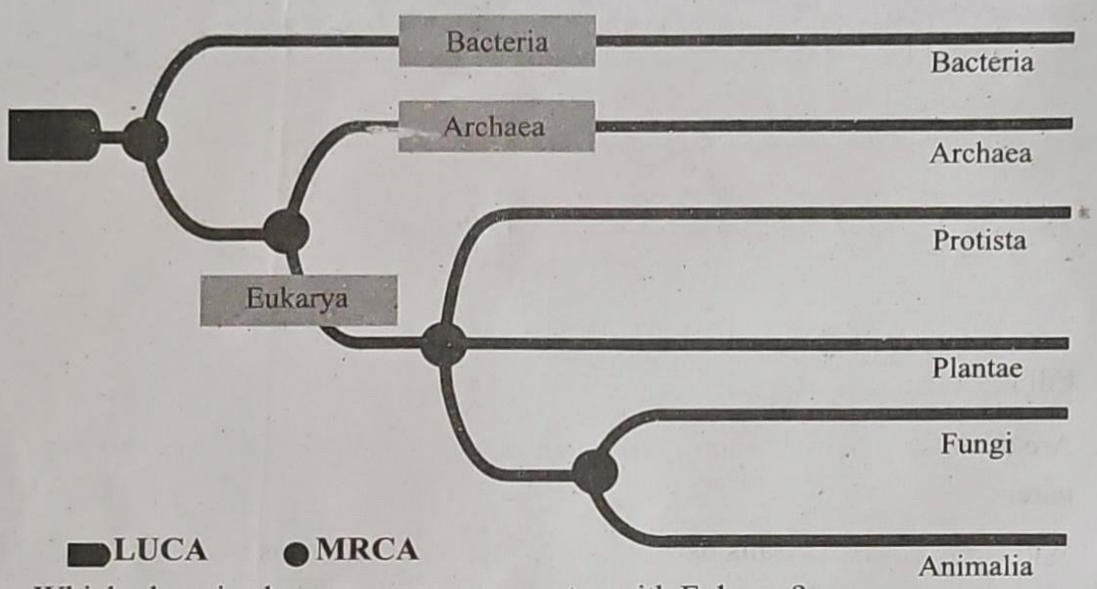
B) Observe the illustration related to protein synthesis and answer the questions.

DNA ----(X)----> **mRNA** ----(Y)----> **Protein**

a) Identify the stages indicated as 'X' and 'Y' (1)

b) RNAs are essential for this process? Explain based on their functions. (2)

17. Observe Illustration of evolutionary tree and answer the questions.



Hints : ■ LUCA ● MRCA

a) Which domain shares a common ancestor with Eukarya? (1)

b) Which are the recently evolved kingdoms in Eukarya? (1)

c) How are the kingdoms mentioned in the illustration related to LUCA? (1)

Answer question 18. It carries 4 score. **(4×1=4)**

18. A) Observe the illustration of monohybrid cross and answer the questions.

Parent Plants

RR × rr

(Round seed) (Wrinkled seed)

Gametes

Tall

F1 Rr

a) What are the alleles that control seed shape? (1)

b) Write the phenotype and genotype of **F1.** (1)

c) Illustrate the hybridization of the **F1** generation with wrinkled seed plant. (2)

OR

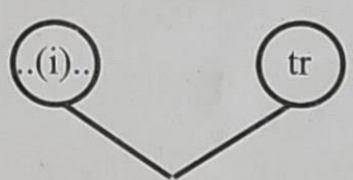
B) Observe the illustration of dihybrid cross considering height of the plant and shape of the seed and answer the questions.

Parent Plants

TTRR X ttrr

(Tall, Round seed) (Dwarf, wrinkled seed)

Gametes



F1 .....(ii) .....

a) Fill in (i) and (ii). (1)

b) Are there any new traits appearing in the second generation that were not seen in the parents? Why? (1)

c) Why are plants with traits like dwarfness and wrinkled seeds less frequent in the F2 generation compared to others? (2)