

**Summative Assessment - III - 2025 - 2026**  
**(Model question paper)**

Class: X

**BIOLOGY**

**Score: 40**

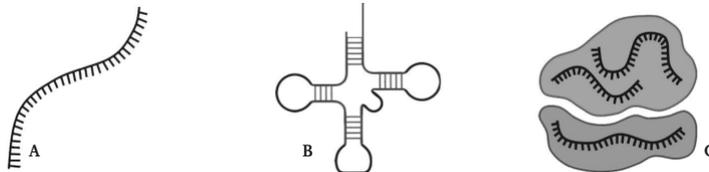
**Time: 1 ½ hrs**

**Instructions:**

1. First 15 minutes is given as cool off time. You may use this 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 6, 8, 10, 14 and 17.

**Answer questions 1 to 4. Each carries 1 score. (4x1=4)**

1. Observe the illustration of different RNAs and choose the correctly labelled option. 1



- a) A- tRNA, B- mRNA, C- rRNA  
 b) A- mRNA, B- rRNA, C- tRNA  
 c) A- mRNA, B- tRNA, C- rRNA  
 d) A-rRNA, B- tRNA, C- mRNA

2. Which cells form the myelin sheath? 1

- i) Oligodendrocyte                      ii) Microglial cell  
 iii) Astrocyte                              iv) Schwann cell

3. Match the information in Column A with the information in Column B and choose the correct one. 1

A. Organism	B. sensory mechanisms
P) Insects	i) Jacobson's organ
Q) Snake	ii) Eye spot
R) Euglena	iii) Echo location
	iv) Ommatidia

- a) P-ii, Q- iii, R - iv                      b) P-iv, Q- i, R- ii  
 c) P-iii, Q- iv, R- i                        d) P-iv, Q-ii, R- iii

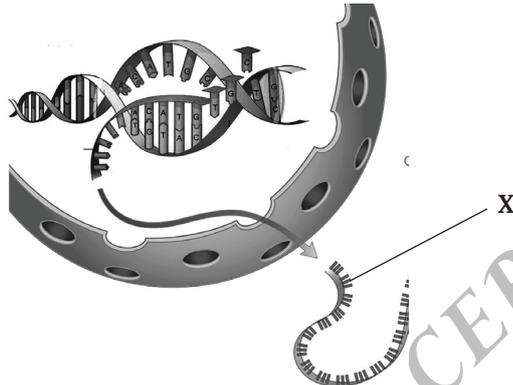
4. Which are the parts of the vestibular system?

1

- a) Semicircular canals, vestibule, cochlea
- b) Cochlea, vestibule, hair cells
- c) Semicircular canals, vestibule, hair cells
- d) Vestibule, semicircular canals, basilar membrane

**Answer questions 5 to 9. Each carries 2 score. (5x2=10))**

5. An illustration of a stage in the process of protein synthesis within a cell is given. Observe it and answer the questions



a) Identify and name the stage of the protein synthesis.

1

b) What is the role of the molecule labelled as X, in protein synthesis?

1

6A. Give reason.

2

- a) Colour blindness affects males more frequently.
- b) Cone cells provide colour vision..

OR

6 B. Analyse the statements about the two fluids in the eye and answer the questions.

**A. Watery fluid**

**B. Jelly-like fluid**

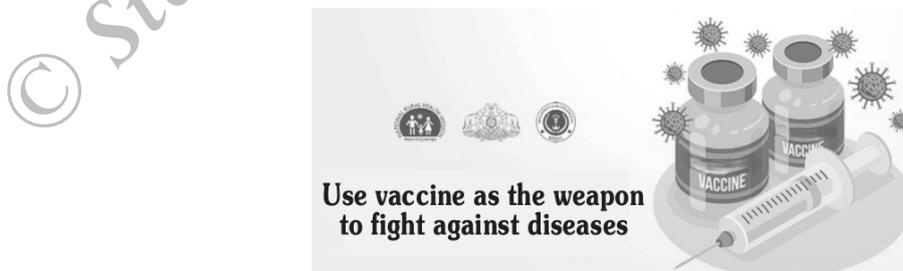
a) Identify and write the names of fluids A and B.

1

b) What are the functions of each of these fluids?

1

7. Observe the poster displayed at the primary health centre and answer the question.



How does a vaccine become a weapon to fight against diseases?

2

8A. Analyse the given indicators about a disease and answer the questions:

- Mosquito-borne disease
- The affected part of the body swells

- a) Name the disease. Which mosquito spreads it? 1
- b) Why does the affected part of the body swell? 1

OR

8B. Analyse the given statement about a disease and answer the questions.

**A condition in which cells multiply through abnormal and uncontrolled cell division and spread to other parts of the body.**

- a) How does this disease spread to other parts of the body? 1
- b) What are the causes of this disease? 1

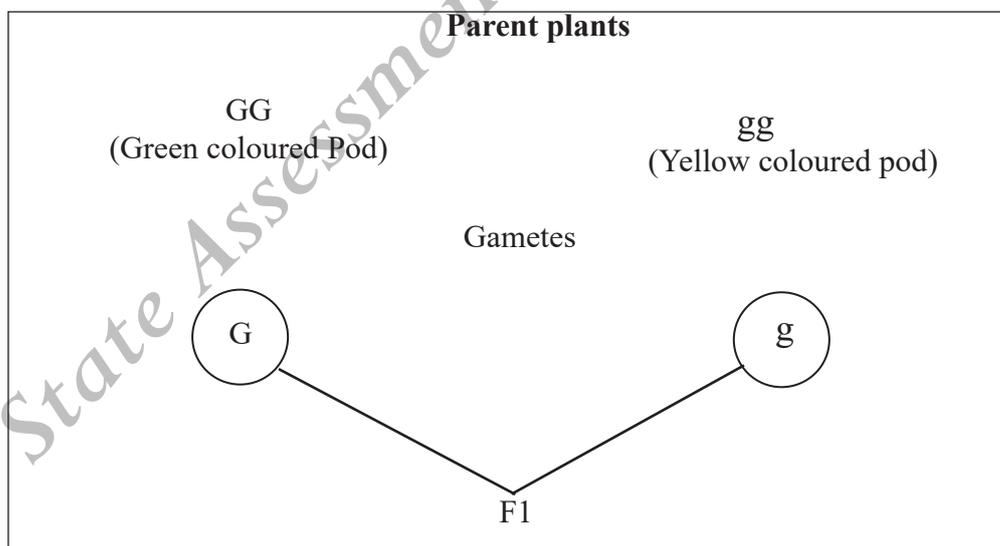
9. Answer the questions by analysing the given statement.

***DNA fingerprinting is a technology used to identify individuals by analyzing the arrangement of nucleotides.***

- a) How can individuals be identified using DNA fingerprinting technology? 1
- b) Write other two uses of this technology. 1

**Answer questions 10 to 15. Each carries 3 score. (6 x3=18)**

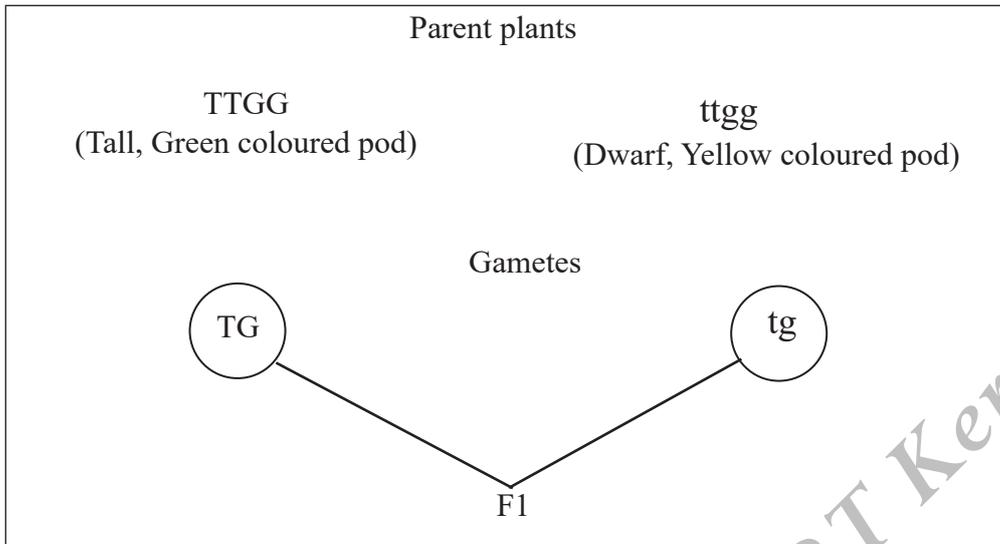
10A. Observe the illustration of a monohybrid cross conducted by Gregor Mendel and answer the questions



- a) Write the phenotype and genotype of F1. 1
- b) Illustrate the self-pollination of F1. 2

OR

10 B. Observe the dihybrid cross conducted based on the height of the pea plant and the colour of the pod, and answer the questions.



- a) Write the phenotype and genotype of F1. 1
- b) When the F1 generation is self-pollinated, what new traits are produced in the F2 generation that are different from the parent plants?? 1
- c) What is the reason for the appearance of new traits in the F<sub>2</sub> generation? 1

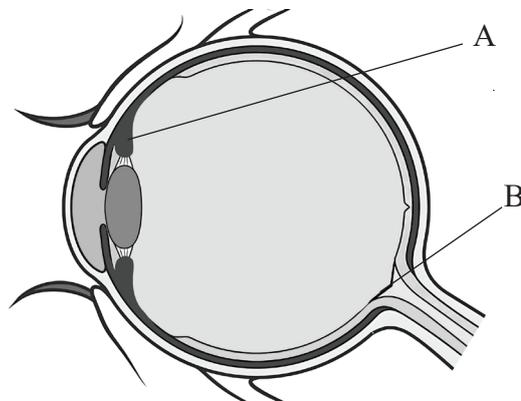
11. Analyse the given statement and answer the questions.

***Variation leads to speciation.***

- a) What is speciation? ? 1
- b) What are the causes of variation? 1
- c) How does variation lead to speciation? 1

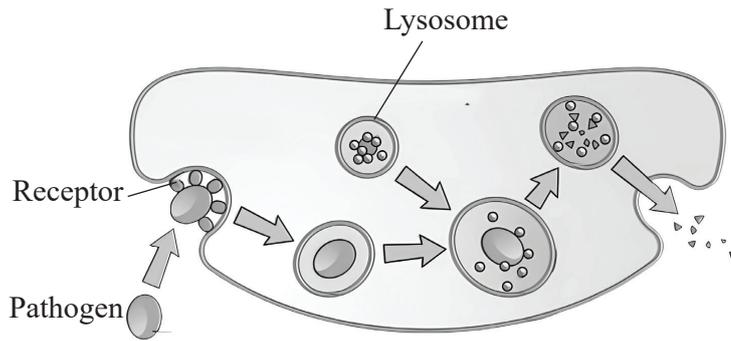
12. Redraw the diagram of Eye and answer the questions.

For redrawing the diagram 1



- a) Name the parts A and B. 1
- b) How does the part A regulate the curvature of the lens when looking at nearby objects? 1

13. Observe the illustration and answer the questions.



- a) Which process is indicated in the illustration? 1  
 b) Illustrate the steps of this process in the form of a flowchart. 2

14 A. Evaluate the statements related to a hormone and answer the questions.

- Stored in the posterior lobe of the pituitary gland
  - Helps to maintain water balance in the body
- a) Which hormone is mentioned here? Which gland produces it?  
 b) How does this hormone maintain water balance in the body during summer and winter?

1  
2  
2

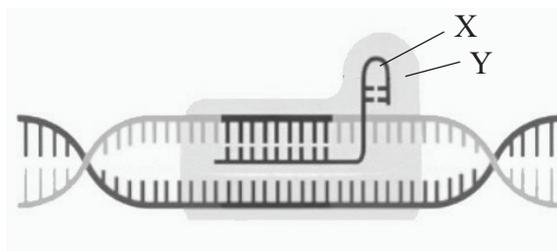
OR

14 B. Evaluate the statements related to hormonal disorders and answer the questions..

- Related to growth hormone.
  - Occurs during the growth period.
- a) Name the hormonal disorders mentioned here?  
 b) Write the cause and symptoms of each

1  
2

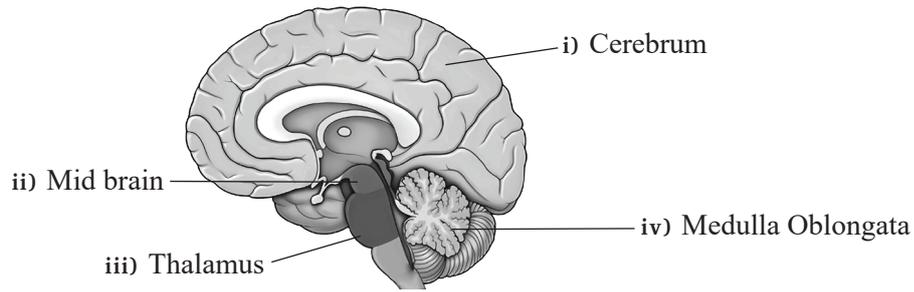
15. Observe the illustration of the main stage of a technology and answer the questions.



- a) Stage of which technology is indicated here? 1  
 b) Which part is indicated as X? Which stage uses it? 1  
 c) Which part is indicated as Y? What is its function? 1

Answer questions 16 and 17. Each carries 4 score. (2 x4=8)

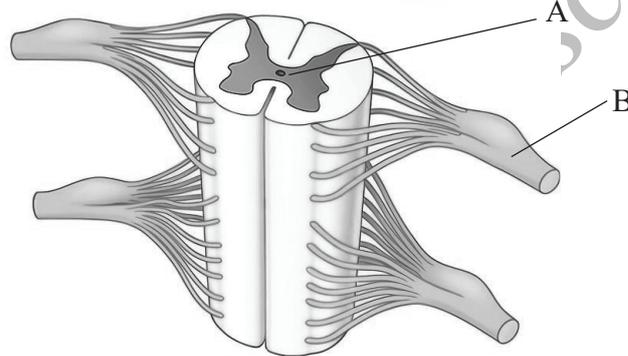
16 A. Observe the illustration and answer the questions. (No need to draw the figure)



- a) If there is any mistake in the labelling, correct it and write it down.. 1
- b) Write the functions of the corrected parts. 2
- c) How is the brain protected? 1

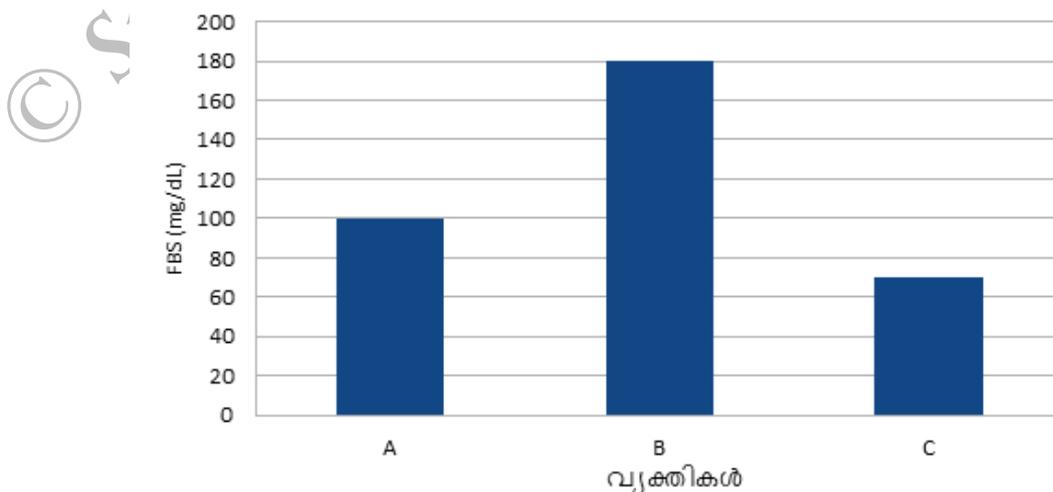
OR

16 B. Observe the illustration and answer the questions. (No need to draw the figure)



- a) Name the parts A and B. 1
- b) Identify the fluid in the part labelled as A? What is its function? 1
- c) How is part B formed? What is its function? 2

17. The graph showing the FBS (Fasting Blood Sugar) levels of three individuals is given. Analyse it and answer the questions.



- a) Which person has diabetes? How can it be identified through graph analysis? 1
- b) Further testing revealed that this patient has type 1 diabetes. What does this mean? (Reason) 1
- c) What is the reason for the increase in type 2 diabetes in children? 1
- d) Write any two consequences that can occur if diabetes is not controlled. 1

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## Summative assessment - III

(Model question paper- Answer key)

Time: 1 ½hr

BIOLOGY

Score : 40

Q. No	Score	Answer/ Value points	Further information
1	1	c) A- mRNA, B- tRNA, C- rRNA	
2	½	i) Oligodendrocyte	
	½	iv) Schwann cell	
3	1	b) P-iv, Q- i, R- ii	
4	1	c) Semicircular canals, vestibule, hair cells	
5	1	a) Transcription	
	1	b) X is mRNA and it contains messages for protein synthesis	
6A	1	a) The defective gene that causes colour blindness is in the X chromosome. Men only have one X chromosome. So, if they have the defective gene that causes color blindness in their X chromosome, they will have color blindness.	
	1	b) Colour vision is made possible when the three types of cones get stimulated in varying proportions when exposed to coloured light depending upon the intensity and wavelength of light.	
6B	½	a) A. Aqueous humor	
	½	B. Vitreous humor	
	½	a) A. Regulates the pressure in aqueous chamber. Provides nutrients and Oxygen to Lens and cornea (Any 1 point)	
	½	b) B. Maintains the shape of the eyeball.	

7	1  1	<p>a) Vaccines stimulate our immune system and helps to produce antibodies against the pathogens.</p> <p>b) These antibodies remain in the body and provide long-term protection against diseases.</p>	
8A	$\frac{1}{2}$  $\frac{1}{2}$  $\frac{1}{2}$  $\frac{1}{2}$	<p>a) Filariasis  Culex mosquito</p> <p>b) Filarial worms lodge in the lymphatic vessels and obstruct the normal flow of lymph. As a result, the affected part of the body swells.</p>	
8B	1  $\frac{1}{2}$ $\frac{1}{2}$	<p>a) Cancer cells spread to other parts of the body through blood and lymph</p> <p>b) Genetic changes, Environmental factors, Viral infections, Lifestyle (Any 2 points)</p>	
9	1  $\frac{1}{2}$ $\frac{1}{2}$	<p>a) Just as fingerprints that vary from person to person, the sequence of nucleotides in each person also vary. This peculiarity helps to identify individuals.</p> <p>b) • To identify culprits • To identify genetic disorders and learn about hereditary diseases • To determine the biological relationship between parents and offspring • To understand lineage by identifying fossils • To identify victims of accidents or disasters • To track endangered species (Any 2 points)</p>	

10A	½ ½	a) phenotype of F1 is Green. Genotype of F1 is Gg.	
	2	b) <div style="text-align: center;"> </div>	
10B	½ ½	phenotype of F1 is Tall, Green. Genotype of F1 is TtGg	
	½ ½	a) Tall plant with yellow pod Dwarf plant with Green pod	
	1	b) When two or more different traits are combined, each trait is inherited independently to the next generation without mixing each other.  OR (A pair of alleles in an organism does not influence the separation of another pair of alleles.)	
11	1	a) Process in which new species arise from a common ancestor is called speciation.	
	1	b) Ecological factors, mutation, natural selection, genetic recombination (Any 2 points)	
	1	c) Favourable variations are passed on to the next generations. More variations accumulate over time leading to the evolution of new species.	
12	1	For redrawing	
	½ ½	a) A. Ciliary muscles B. Blind spot	
	1	b) when looking at near objects, ciliary muscles contract. Ligaments get loosen. Thus curvature or convexity of the lens increases.	

13	1	a) Phagocytosis										
	2	<p>b) Phagocyte reaches near the pathogen ----&gt;</p> <p>With the help of receptors, the pathogen is captured and engulfed, forming a phagosome.</p> <p>----&gt; Lysosome combines with the phagosome to form a phagolysosome</p> <p>----&gt;Enzymes in the lysosome destroy the pathogen</p> <p>----&gt; The debris is expelled.</p>										
14A	$\frac{1}{2}$ $\frac{1}{2}$	<p>a) ADH ( Vasopressin)</p> <p>Hypothalamus</p>										
	1	<p>b) during summer, the production of vasopressin increases. It speeds up water reabsorption in the kidney. As a result, the production of urine decreases.</p> <p>During winter, the production of vasopressin (ADH) decreases. The reabsorption of water from the kidneys also decreases. As a result, the production of urine increases</p>										
14B	$\frac{1}{2}$ $\frac{1}{2}$	a) Dwarfism and Gigantism										
	$\frac{1}{2} \times 4 = 2$	<p>b)</p> <table border="1"> <thead> <tr> <th></th> <th>Causes</th> <th>Symptoms</th> </tr> </thead> <tbody> <tr> <td>Dwarfism</td> <td>The production of somatotropin decreases during the growth phase</td> <td>Stunted growth</td> </tr> <tr> <td>Gigantism</td> <td>The production of somatotropin increases during the growth phase</td> <td>Excessive body growth</td> </tr> </tbody> </table>		Causes	Symptoms	Dwarfism	The production of somatotropin decreases during the growth phase	Stunted growth	Gigantism	The production of somatotropin increases during the growth phase	Excessive body growth	
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Dwarfism	The production of somatotropin decreases during the growth phase	Stunted growth										
Gigantism	The production of somatotropin increases during the growth phase	Excessive body growth										

15	1	a) CRISPR technology	
	½	b) gRNA.	
	½	Identifying the target	
	½	c) Cas9 enzyme	
	½	It cuts the DNA segment identified by the gRNA	
16A	½	a) iii)Pons	
	½	iv)Cerebellum	
	1	b) Pons – Coordinates the muscular activities of the eye and the face. Regulates the rate of ventilation. (any 1 point)	
	1	Cerebellum- Helps to maintain equilibrium of the body by coordinating muscular activities.	
	1	By the help of skull, meninges and cerebrospinal fluid.	
16B	½	a) A. Central canal	
	½	B. Spinal nerve	
	½	b) Cerebrospinal fluid.	
	½	Provides oxygen and nutrients to the tissues of central nervous system/ Eliminates wastes from the central nervous system/ Regulates the pressure / Protects the central nervous system from external injuries. (any 1 point)	
	1	c) It is formed by Dorsal root and ventral root.	
	1	It helps to transmit messages from different parts of the body to the spinal cord and transmits instructions from spinal cord to the different parts of the body.	

17	½	a) Person B.	
	½	The FBS level in healthy individuals typically ranges from 70 to 100 mg/ dL. From the graph, it can be understood that the FBS level of person B is 180 mg/dL.	
	1	b) Type -1 diabetes is the condition in which insulin production capacity is lost due to the destruction of beta cells.	
	1	c) Unhealthy dietary habits and lack of exercise are the causes of an elevated level of type 2 diabetes among children.	
	½ ½	d) Consequences that can occur if diabetes is not controlled are Retinopathy, Neuropathy, Nephropathy or Resistance to insulin (Any 2 points)	