SET A

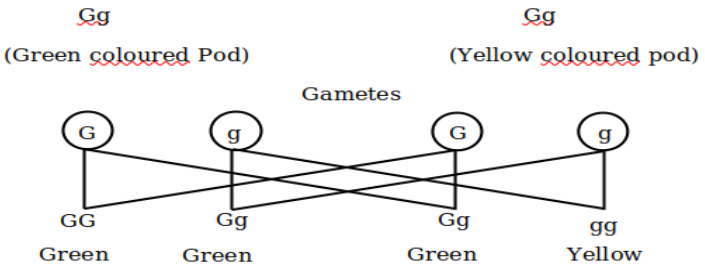
Summative assessment - III

(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 ½	i) Oligodendrocyte 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 ½	a) A. Aqueous humor B. Vitreous humor	
	½ ½	a) A. Regulates the pressure in aqueous chamber. Provides nutrients and Oxygen to Lens and cornea (Any 1 point) b) B. Maintains the shape of the eyeball.	

7	1 1	a) Vaccines stimulate our immune system and helps to produce antibodies against the pathogens. b) These antibodies remain in the body and provide long-term protection against diseases.	
8A	½ ½	a) Filariasis Culex mosquito	
	½ ½	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.	
8B	1	a) Cancer cells spread to other parts of the body through blood and lymph	
	½ ½	b) Genetic changes, Environmental factors, Viral infections, Lifestyle (Any 2 points)	
9	1	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.	
	½ ½	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)	

10A	½ ½	a) phenotype of F1 is Green. Genotype of F1 is Gg.	
	2	b)  	
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.	

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<tr><td>13</td><td>1</td><td>a) Phagocytosis</td><td></td></tr>
<tr><td></td><td>2</td><td>b) Phagocyte reaches near the pathogen ---->

With the help of receptors, the pathogen is captured and engulfed, forming a phagosome.

----> Lysosome combines with the phagosome to form a phagolysosome

---->Enzymes in the lysosome destroy the pathogen

----> The debris is expelled.</td><td></td></tr>
<tr><td rowspan="2">14A</td><td>½ ½</td><td>a) ADH (Vasopressin)

Hypothalamus</td><td></td></tr>
<tr><td>1

1</td><td>b) during summer, the production of vasopressin increases. It speeds up water reabsorption in the kidney. As a result, the production of urine decreases.

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</td><td></td></tr>
<tr><td>14B</td><td>½ ½</td><td>a) Dwarfism and Gigantism</td><td></td></tr>
<tr><td></td><td>½ x 4 = 2</td><td>b)
<table>
<tr><th></th><th>Causes</th><th>Symptoms</th></tr>
<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>
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15	1	a) CRISPR technology	
	½ ½	b) gRNA. Identifying the target	
	½ ½	c) Cas9 enzyme It cuts the DNA segment identified by the gRNA	
16A	½ ½	a) iii)Pons iv)Cerebellum	
	1 1	b) Pons – Coordinates the muscular activities of the eye and the face. Regulates the rate of ventilation. (any 1 point) Cerebellum- Helps to maintain equilibrium of the body by coordinating muscular activities.	
	1	By the help of skull, meninges and cerebrospinal fluid.	
16B	½ ½	a) A. Central canal B. Spinal nerve	
	½ ½	b) Cerebrospinal fluid. 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 1	c) It is formed by Dorsal root and ventral root. 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 ½	a) Person B. 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)	