

**RUBRICS: SSC I 1<sup>st</sup> ANNUAL EXAMINATION 2024**  
**SUBJECT: BIOLOGY-I (Hard Area)**

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
2(i)	<b>Level of organization</b>	Identifying the correct levels of all the six structures i.e Nose = Organ level DNA = Molecular level Muscles = Tissue level Carbon = Atomic level Neuron = Cellular level Golgi Bodies = Organelle level (3)	Any five correct levels (2.5)	Any four correct levels (2)	Any three correct levels (1.5)	Any two correct levels (1)	Any one correct level (0.5)	Wrong answer (0)
OR	<b>a) Difference between Prosthetic group and Coenzyme with example.</b>	Correct differentiation with example such as Prosthetic group: If cofactor is tightly bound to the enzymes. Permanent basis. e.g., Haem group) Coenzymes: If Cofactor is detachable. e.g., NAD, coenzyme A and Vitamin A. (1.5)	One correct difference with no example <b>OR</b> Definition and example of any one (1)	Some relevant information (0.5)	Wrong answer (0)			
	<b>b) Difference between Catabolism and Anabolism with example</b>	Correct differentiation with example such as <u>Catabolism</u> : Breakdown of complex molecules in to simple molecules. Destructive process. Energy is released. e.g., Respiration) ( <u>Anabolism</u> : Formation of complex molecules from simple molecules. Constructive process.	One correct difference with no example <b>OR</b> any one type defined with example (1)	Some relevant information (0.5)	Wrong answer (0)			

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		Energy is absorbed or utilized. e.g., Photosynthesis (1.5)						
2(ii)	<b>Importance of data analysis for hypothesis</b>	Correct description mentioning the importance of data analysis for three reasons i.e. rejection of hypothesis, modifying a hypothesis and confirming a hypothesis. (3)	Correct answer of any two criteria of importance (2)	Correct answer of any one criteria of importance (1)	Some relevant information. (0.5)	Wrong answer(0)		
<b>OR</b>	<b>Location, structure and function of centrioles</b>	Correct description of all the three aspects such as: <u>Location</u> : Near the outer surface of nucleus <u>Structure</u> : Nine triplets of microtubules arranged to form a hollow cylinder. <u>Function</u> : Formation of spindle fibers. (3)	Any two correct criteria (2)	Any one correct criteria (1)	Wrong answer(0)			
2(iii)	<b>Scientific name of Brinjal :</b>	Correct name i.e. <i>Solanum melangena</i> (1)	Only correct genus name (0.5)	Wrong answer (0)				
	<b>Scientific name of Potato :</b>	Correct name i.e. <i>Solanum tuberosum</i> (1)	Only correct genus name (0.5)	Wrong answer (0)				
	<b>Scientific name of Rice:</b>	Correct name i.e. <i>Oryza sativa</i> (1)	Only correct genus name (0.5)	Wrong answer (0)				
<b>OR</b>	<b>Deficiency symptoms of water :</b>	Any three correct symptoms like severe	Any two correct symptoms (1)	Any one correct symptom (0.5)	Wrong answer (0)			

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		dehydration can damage brain, kidney and cardiovascular system. It can be fatal if 20% of body water is lost etc. (1.5)						
	<b>Deficiency symptoms of dietary fibers:</b>	Any three correct symptoms like lack of proper peristaltic movement, rapid emptying of stomach, the undigested matter in large intestine cannot move fast and causes constipation. (1.5)	Any two correct symptoms (1)	Any one correct symptom (0.5)	Wrong answer (0)			
2(iv)	<b>Extinct species:</b>	Correct definition with one correct example, Such as: A specie of plant and animal that no longer lives anywhere on earth e.g. dodo, woolly mammoth, dinosaurs etc. (1.5)	Correct definition with no correct example. (1)	Some relevant information.(0.5)	Wrong answer (0)			
	<b>Endangered species:</b>	Correct definition with one correct example, Such as A specie which is in danger of becoming extinct. e.g. Bengal tiger, panda, snow leopard, green turtle etc. (1.5)	Correct definition with no correct example. (1)	Some relevant information.(0.5)	Wrong answer (0)			

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<b>OR</b>	<b>Rules for suggesting and documenting scientific names</b>	Correct listing of any three rules like, each scientific name has two parts, the first part represents genus and second part represents species, the genus name begins with a capital letter while species name begins with a small letter. Both genus and species names italicized or underlined separately (3)	Any two correct rules. (2)	Any one correct rule. (1)	Some relevant information.(0.5)	Wrong answer (0)		
<b>2(v)</b>	<b>Labeled diagram of prokaryote (bacterium)</b>	Correct drawing with two correct labeling. (3)	Correct drawing with one correct labeling. (2)	Correct drawing without/with wrong labeling.(1)	Some relevant information.(0.5)	Wrong answer (0)		
<b>OR</b>	<b>Labeled diagram of mitochondrion.</b>	Correct drawing with two correct labeling. (3)	Correct drawing with one correct labeling. (2)	Correct drawing without/with wrong labeling.(1)	Some relevant information.(0.5)	Wrong answer (0)		
<b>2(vi)</b>	Diagram A : Metaphase	Correct stage name and two correct salient features like spindle fibres become attached with the centromere of chromosome and arrange them on equator of the cell forming metaphase plate (1.5)	Correct stage name with one salient feature.(1)	Correct stage name with wrong salient features/ wrong stage name with one correct salient feature.(0.5)	Wrong answer (0)			
	Diagram B : Anaphase	Correct stage name and two correct salient		Correct stage name with wrong salient	Wrong answer (0)			

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	.)	features, like spindle fibres contract, sister chromatids of each chromosome separates and begin to move to the opposite poles and reach the respective poles (1.5)	Correct stage name with one salient feature.(1)	features/ wrong stage name with one correct salient feature.(0.5)				
2(vi)	<b>Identifying labeled parts in stomach diagram</b>	Correct names of labels i.e. A = Oesophagus B = Cardiac end C = Pyloric region D = Duodenum (2)	Any three correct labeling. (1.5)	Any two correct labeling. (1)	Any one correct labeling. (0.5)	Wrong answer. (0)		
	<b>Name of diagram</b>	Correct name i.e. Structure of stomach. (1)	Wrong name. (0)					
2(vii)	<b>Definition of necrosis, its causes and process in the body</b>	Correct description of all three aspects i.e <u>Necrosis</u> : Premature or accidental cell death. <u>Causes</u> : Due to disease, injury or failure of blood supply. <u>Necrosis in body</u> : If blood supply to cardiac muscle is cut for one hour or more, necrosis will occur and many heart cells will die.. (3)	Correct description of any two aspects (2)	Any one correct information. (1)	Some relevant information.(0.5)	Wrong answer (0)		
OR	<b>Effect of wind on Transpiration :</b>	Correct description of the effect of wind on transpiration i.e. In moving air, the water vapours will be moved away from the leaf as far as it diffuses out.	Partially correct description (1)	Some relevant information. (0.5)	Wrong answer. (0)			

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		This will speed up transpiration.(1.5)						
	<b>Effect of humidity on transpiration:</b>	Correct description of the effect of wind on transpiration i.e. If the air is very humid, then it will allow very little water vapours to escape from the plant. So, transpiration slows down. (1.5)	Partially correct description (1)	Some relevant information. (0.5)	Wrong answer. (0)			
2(viii)	<b>Symptoms of thalassemia :</b>	Any two correct symptoms like severe anemia, fatigue, bleeding gums, larger spleen etc. (1)	Any one correct symptom. (0.5)	Wrong answer (0)				
	<b>Treatment:</b>	Two correct treatments i.e. Blood transfusion and bone marrow transplant (1)	Any one correct treatment. (0.5)	Wrong answer (0)				
	<b>Preventive measures :</b>	Any two preventive measures like Genetic counselling, marriage between thalassemia minor persons should be avoided. (1)	Any one preventive measure. (0.5)	Wrong answer (0)				
OR	<b>Effect of temperature on enzyme activity :</b>	Correct description mentioning at least two criteria like Increase in temperature increases the activity of enzyme and it will become fastest at optimum temperature. After optimum temperature,	Correct description mentioning at least one criteria (1)	Some relevant information. (0.5)	Wrong answer (0)			

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		rise in temperature decreases the enzyme activity due to denaturation.(2)						
	<b>Graph</b>	Correct and labeled graph (1)	Partially correct and labeled graph/correct and unlabeled graph. (0.5)	Wrong answer (0)				
2(ix)	<b>Name of model : Induced fit model</b>	Correct name.(1)	.Wrong answer (0)					
	<b>Description of induced fit model :</b>	Correct description, mentioning at least two criteria like D. Koshland proposed it, the binding of a substrate to enzyme cause a change in the shape of its active site. Active site is not a rigid structure. It is flexible, the model is more acceptable etc. (2)	Correct description, mentioning at least one criteria (1)	Some relevant information (0.5)	Wrong answer (0)			
OR 2(ix)	<b>Changes in G-1 Phase:</b>	Correct description of any three criteria like First sub-phase before DNA synthesis begins. Cell increases protein production. Increases the number of many of its organelles such as mitochondria and ribosomes. Grow in size. Increased activity of enzyme required for DNA synthesis etc. (1.5)	Correct description of any two criteria (1)	Correct description of any one criteria (0.5)	Wrong answer (0)			
	<b>Changes in G-2</b>	Correct description of	Correct description of any	Some relevant	Wrong answer			

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	<b>Phase :</b>	any two criteria like last sub-phase before cell division. In this phase increased protein synthesis occurs for the production of spindle fibers.(1.5)	one criteria. (1)	information (0.5)	(0)			
2(x)	<b>Granular leukocytes</b>	Correct description i.e. Their cytoplasm contain fine granules and their nucleus is variable in shape. (1)	Partially correct. (0.5)	Wrong answer. (0)				
	<b>Types of granular leukocytes</b>	Correct name and description of any two types such as <b>Neutrophils:</b> They engulf pathogens during phagocytosis. <b>Eosinophils:</b> They are involved in the control of allergic reactions. <b>Basophils:</b> They release histamine in injured tissue and in allergic response. (2)	Correct name and description of any one type (1)	Some relevant description like correct names and wrong description. (0.5)	Wrong answer (0)			
OR	<b>Flow chart for light dependent reaction of photosynthesis</b>	Correct sketch with relevant information containing at least three criteria like showing photosystem I and photosystem II, photolysis of water, Emission of electron from chlorophyll "a" of photosystem II and passing of this electron	Correct sketch with some relevant information missing (2)	Only sketch with no relevant information. (1)	Wrong answer. (0)			



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		through electron transport chain to synthesize ATP, emission of electron pair from photosystem I and to reduce NADP+ to NADPH. (3)						
2(xi)	<b>Comparison of Glycolysis and Krebs cycle.</b>	<p>Correct comparisons mentioning at least three points of difference like</p> <p><u>Glycolysis</u> : Take place in cytoplasm outside the mitochondria. Occurs both in aerobic &amp; an-aerobic respiration. Breakdown of glucose in to two molecules of pyruvic acid. Two ATP molecules are produced as net energy gain. Two NAD+ molecules are reduced to NADH).</p> <p>(<u>Krebs Cycle</u> : It is a cyclic process and take place in mitochondrial matrix. Before Krebs cycle, Pyruvic acid is oxidized in to a two carbon acetyl group which combine with coenzyme A to form acetyl Co A. Carbon dioxide is removed and NADH is produced. Co enzymes A is released and acetyl group</p>	Any two correct comparisons. (2)	Any one correct comparison. (1)	Some relevant information (0.5)	Wrong answer(0)		

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OR		passes through a series of reactions . Products are CO <sub>2</sub> , NADH and FADH <sub>2</sub> . Some energy is released to produce ATP directly. (3)						
	Significance of Meiosis :	<p>Correct significance describing both points i.e. <b>Maintenance of chromosome number in next generation:</b> Germ line cells undergo meiosis to produce haploid gametes. Male and female gametes unite to form diploid zygote which undergoes repeated mitosis to develop in to new diploid organism.</p> <p><b>Production of variations in next generation:</b> The chromosomes undergo crossing over during meiosis which results in genetic variations. So, meiosis provides variations in next generation. (3)</p>	Any one significance. (1.5)	Some relevant information. (1)	Wrong answer. (0)			
3	<b>Translocation</b>	Correct definition/introduction of translocation i.e. the movement of food through phloem from sources to various parts	Incomplete definition. (0.5)	Wrong answer (0)				

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		of plant body. (1)						
	<b>Pressure flow hypothesis</b>	Correct description of pressure flow hypothesis mentioning at least four criteria like food transported as sucrose, through phloem, from source to sinks, along pressure gradients, loading of food at source into sieve tubes, unloading food at sink from sieve tubes to the surrounding cells etc. (4)	Correct description of pressure flow hypothesis mentioning at least three criteria (3)	Correct description of pressure flow hypothesis mentioning at least two criteria (2)	Correct description of pressure flow hypothesis mentioning at least one criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
OR	<b>Digestion in small intestine</b>	Correct description mentioning any six criteria like chyme passing through duodenum receive bile from liver and pancreatic juice from pancreas, emulsification of lipids, digestion in jejunum and ileum, pancreatic amylase digesting starch into maltose and glucose, lipase digesting lipids into glycerol and fatty	Correct description mentioning any five criteria (2.5)	Correct description of any four criteria (2)	Correct description of any three criteria (1.5)	Correct description of any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)

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		acids, trypsin digesting protein into polypeptides, intestinal enzymes like erypsin, enterokinase completing protein digestion, lactase and maltase completing carbohydrate digestion etc. (3)						
	<b>Diagram of villus</b>	Correct diagram with at least four labels. (2)	Correct diagram with two labels (1)	Some relevant information (0.5)	Wrong answer (0)			
<b>4</b>	<b>Relationship of biology with other sciences</b>	Correct description explaining at least five interdisciplinary sciences like biochemistry, biophysics, biomathematics, biogeography, bioeconomics with examples etc (5)	Correct description mentioning at least four sciences (4)	Correct description mentioning at least three sciences (3)	Correct description mentioning at least two sciences (2)	Correct description mentioning at least one science (1)	Some relevant information (0.5)	Wrong answer (0)
OR	<b>Compound tissue (xylem)</b>	Correct description mentioning any five criteria like, thick lignified cell walls, hollow and dead, no nucleus, consists of different types of cells i.e. tracheid's and vessels, form continuous system throughout plant body, transport water and	Correct description mentioning any four criteria (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)	

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		minerals, give support etc. (2.5)						
	<b>Compound tissue (phloem)</b>	Correct description mentioning any five criteria like, cells are tubular, have cytoplasm, living cells, two types of cells i.e. sieve tubes and companion cells, cytoplasm of neighboring cells connects, small pore at end walls, transport of organic food etc. (2.5)	Correct description mentioning any four criteria (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
5	<b>Completing and balancing the equation of photosynthesis</b>	Correct balanced equation i.e. $6\text{CO}_2 + 12\text{H}_2\text{O} \text{-----}\rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$ (1)	Unbalanced or incomplete equation (0.5)	Wrong answer (0)				
	<b>Role of light in photosynthesis</b>	Description of the role of light mentioning at least four criteria like photosynthesis takes place in visible light, that comes in photons, absorbed by pigments, blue, red and orange light mostly absorbed, no photosynthesis without light etc. (2)	Description of the role of light mentioning at least three criteria (1.5)	Description of the role of light mentioning at least two criteria (1)	Description of the role of light mentioning at least one criteria/ some relevant information (0.5)	Wrong answer (0)		

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	<b>Role of chlorophyll in photosynthesis</b>	Correct description of the role of chlorophyll mentioning at least four criteria like no photosynthesis without chlorophyll, chlorophyll found in thylakoid membranes of chloroplast, two types i.e. chlorophyll-a and chlorophyll-b, convert light energy into chemical energy, arranged in clusters called photosystems in thylakoid membranes etc. (2)	Description of the role of chlorophyll mentioning at least three criteria (1.5)	Description of the role of chlorophyll mentioning at least two criteria (1)	Description of the role of chlorophyll mentioning at least one criteria/ some relevant information (0.5)	Wrong answer (0)		
OR	<b>Difference between pulmonary and systemic circulation</b>	Correct description mentioning at least two criteria of differentiation like pulmonary circuit supply to lungs and systemic supply blood to all other organs, arteries of pulmonary circulation carry deoxygenated while that of systemic carry oxygenated blood, veins of pulmonary circuit bring oxygenated while that of systemic bring deoxygenated blood to heart etc. (2)	Correct description mentioning at least two criteria (1)	Some relevant information (0.5)	Wrong answer (0)			

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	<b>Functions of superior vena cava, femoral arteries and inferior vena cava</b>	Correct functions of all the three i.e. <b>superior vena cava</b> is formed by the union of jugular vein and subclavian vein and bring deoxygenated blood from upper parts of body to right atrium, <b>femoral arteries</b> supply oxygenated blood to legs and feet, inferior vena cava is formed by the union of many veins that bring deoxygenated blood from lower parts of body to right atrium. (3)	Correct functions of any two (2)	Correct functions of any one (1)	Some relevant information (0.5)	Wrong answer (0)				
6	<b>Name of the largest gland</b>	Correct name of the gland i.e. Liver (1)	Wrong answer (0)							
	<b>Role of liver in the body</b>	Correctly listing eight functions of liver like Manufacture bile, store extra glucose as glycogen, convert glycerol and amino acids into glucose, remove amino groups from amino acids, convert ammonia into urea, plasma protein are synthesized, destroy old red blood cells, stores fat soluble vitamin and	Correctly listing seven functions of liver (3.5)	Correctly listing six functions of liver (3)	Correctly listing five functions of liver (2.5)	Correctly listing four functions of liver (2)	Correctly listing three functions of liver (1.5)	Correctly listing two functions of liver (1)	Correctly listing one function of liver (0.5)	Wrong answer (0)

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		minerals etc. (4)						
OR	<b>Structure of cell membrane</b>	Correct description of structure mentioning at least three criteria like thin, semipermeable boundary of animal cell and lie inner to cell wall in plant cells, composed of phospholipids, proteins and small amount of carbohydrates, represented by fluid mosaic model, lipid bilayer with proteins partly or totally embedded etc. (1.5)	Correct description of structure mentioning at least two criteria (1)	Some relevant information (0.5)	Wrong answer (0)			
	<b>Functions of cell membrane</b>	Correctly listing at least three functions like contact point of cell with environment, stops escape of substances from cell, controls the entry of substances needed to cell, allow wastes to move out of the cell, transmit chemical messages between cells etc. (1.5)	Correctly listing at least two functions (1)	Correctly listing at least one function (0.5)	Wrong answer (0)			



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	<b>Diagram of cell membrane</b>	Correct diagram of the fluid mosaic model with at least four labeling (2)	Correct diagram of the fluid mosaic model with at least three labeling (1.5)	Correct diagram of the fluid mosaic model without labeling (1)	Some relevant diagram (0.5)	Wrong answer (0)		

**RUBRICS: SSC 1<sup>st</sup> ANNUAL EXAMINATION 2024**  
**SUBJECT: BIOLOGY-I (Local)**

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
2(i)	<b>a. Relevant branch of biology(Green leaves)</b>	Correct name and explanation of any branch of biology like, Botany--- study of plants OR Morphology---study of structures of an organism OR Anatomy --- study of organs OR Physiology--- study of functions of structures of an organism (1.5)	Correct name and partially correct explanation of any branch of biology (1)	Some relevant information(0.5)	Wrong answer(0)			
	<b>b. Relevant branch of biology(Heredity)</b>	Correct name and explanation of any branch of biology with respect to heredity like, Transmission of traits from one generation to next OR transmission of gene identifying traits from parents to offsprings. (1.5)	Correct name and partially correct explanation of branch of biology (1)	Some relevant information(0.5)	Wrong answer(0)			
<b>OR</b>	<b>Composition, structure and function of Ribosome</b>	Correct explanation of all three aspects ie Composition: Equal amount of RNA and proteins, Structure: Consists of a large and small subunits held together and function: Site of protein synthesis (3)	Correct explanation of any two of the given features of ribosomes.(2)	Correct explanation of any one of the given features of ribosomes.(1)	Some relevant information(0.5)	Wrong answer(0)		

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2(ii)	<b>Observations of A.F.A king regarding malaria</b>	Correct listing of the three observations i.e 1) People who slept outdoors were more likely to get malaria than those who slept outdoors. 2) People who slept under fine nets were less likely to get malaria than those who did not use such nets. 3) People who slept near smoky fire usually did not get malaria.(3)	Correct explanation of any two observations (2)	Correct explanation of any one observation.(1)	Some relevant information(0.5)	Wrong answer(0)		
OR	<b>Definition of Plaques</b>	Correct definition i.e. The deposits of cholesterol in arteries that block them (1)	Some relevant information(0.5)	Wrong answer(0)				
	<b>Definition of Thrombus</b>	Correct definition i.e. when the plaques/ clot remain stationary on the irregular arterial wall. (1)	Some relevant information(0.5)	Wrong answer(0)				
	<b>Definition of Embolus</b>	Correct definition i.e. The dislodged clot moving along with the blood. (1)	Some relevant information(0.5)	Wrong answer(0)				
2(iii)	<b>a. Reasons for Exclusion of Viruses from five kingdom system of classification</b>	Correct explanation mentioning any three reasons like, Viruses have no nucleus, cytoplasm, cell organelles or cell membrane. 2) They do not feed, respire, excrete or						

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		grow. 3) Viruses do reproduce, but only inside the cells of living organisms; and the host cell provides materials for their reproduction. 4) Outside the host , viruses exists in the form of crystals.(1.5)	Correct explanation of any two reasons .(1)	Correct explanation of any one reason.(0.5)	Wrong answer (0)			
	<b>b. Virus particle flow chart labeling of missing parts</b>	Correct labeling of three missing parts i.e Protein coat, DNA, RNA (1.5)	Correct labeling of any two missing parts (1)	Correct labeling of any one missing part (0.5)	Wrong answer (0)			
<b>OR</b>	<b>Missing information in table.</b>	All six correct answers i.e Lipase and Lipids in row 1, Peptides and amino acids in row 2, Lactase and glucose and galactose in row 3 (3)	Any five correct answers (2.5)	Any four correct answers (2)	Any three correct answers (1.5)	Any two correct answers (1)	Any one correct answers (0.5)	Wrong answer (0)
2(iv)	<b>Description of Horticulture</b>	Correct explanation of horticulture i.e. the science and art of gardening. The careers involved are plant breeding, horticulture etc (1.5)	Partially Correct explanation of horticulture (1)	Some relevant information(0.5)	Wrong answer(0)			
	<b>Description of Animal Husbandry</b>	Correct explanation of animal husbandry i.e. Care and breeding of domestic animals. Careers involved are Veterinary science, animal breeding and animal training. (1.5)	Partially correct explanation of animal husbandry (1)	Some relevant information(0.5)	Wrong answer(0)			

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OR	<b>Any Three causes of deforestation.</b>	Correct listing of any three causes of deforestation like, 1. For timber, 2.To get land for agriculture 3. To make roads, airports etc 4. To get land for grazing (3)	Correct explanation of any two causes of deforestation (2)	Correct explanation of any one cause of deforestation (1)	Some relevant information (0.5)	Wrong answer (0)		
2(v)	<b>Draw and labeling structure of Neuron</b>	Correct drawing with any four correct labeling (3)	Correct drawing with any three correct labeling (2.5)	Correct drawing with any two labeling (2)	Correct drawing with any one labeling (1.5)	Correct drawing with no labeling (1)	Wrong answer (0)	
OR	<b>Draw and labeling transverse section of leaf</b>	Correct drawing with any four correct labeling (3)	Correct drawing with any three correct labeling (2.5)	Correct drawing with any two correct labeling (2)	Correct drawing with any one correct labeling (1)	Correct drawing with no labeling (1)	Wrong answer (0)	
2(vi)	<b>Events in the process of Apoptosis</b>	Correct description mentioning any three events like Programmed cell death, In G1 phase apoptosis begins, Show cell shrinkage and chromatin condensation, Blebs form apoptotic bodies, Apoptotic bodies phagocytosed by White blood cells. (3)	Correct description of any two events (2)	Correct description of any one event (1)	Some relevant information(0.5)	Wrong answer(0)		
	<b>Cytokinesis in plant cell</b>	Correct explanation of cytokinesis i.e. Golgi Vesicles move to the	Partially Correct explanation of cytokinesis / partially correct diagram	Some relevant information (0.5)	Wrong answer (0)			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
OR		middle of cell , fuse to form cell plate or phragmoplast, plate grows outward ,membranes fuse with plasma membrane forming two daughter cells / correct diagram showing comparison (1.5)	showing comparison (1)					
	<b>Cytokinesis in animal cell</b>	Correct explanation of cytokinesis i.e. cleavage occurs, formation of cleavage furrow, metaphase plate, and furrow deepens, pinches the parent cell into two daughter cells / correct diagram showing comparison (1.5)	Partially Correct explanation of cytokinesis / partially correct diagram showing comparison(1)	Some relevant information(0.5)	Wrong answer(0)			
<b>2(vii)</b>	<b>Changes that occur in Prophase.</b>	Correct description of any three changes like, Centrioles divide and move to opposite pole of the cell, Condensation of chromatin to chromosome, Spindle fibers formed between centrioles, Mitotic apparatus established, Nucleolus disappears and nuclear membrane disintegrates. (3)	Any two correct events (2)	Any one correct event(1)	Some relevant information(0.5)	Wrong answer(0)		
OR	<b>Structure of Veins.</b>	Correct explanation of the structure mentioning	Some relevant information(0.5)					

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		any two criteria like Consists of three layers i.e. inner, middle and outer layer. The inner layer is thin almost inelastic etc. (1)		Wrong answer(0)				
	<b>Two Characteristics of veins</b>	Correct description mentioning any two characteristics like, No pulse, Thin muscular layer, Have large lumen with thin walls, All veins carry deoxygenated blood except pulmonary veins etc. (2)	Correct description mentioning any one characteristic (1)	Some relevant information(0.5)	Wrong answer(0)			
<b>2(viii)</b>	<b>Ways enzymes lower the activation energy.</b>	Correct description mentioning any three ways like May change the shape of the substrate, Alter the charge distribution on substrate. Position the substrates together in the proper orientation. Add or removal functional groups on the substrate.(3)	Any two correct ways.(2)	Any one correct way.(1)	Some relevant information(0.5)	Wrong answer(0)		
<b>OR</b>	<b>Role of oral cavity in digestion of food.</b>	Correct description mentioning any three correct events/roles like, Food is tasted, smelled and felt. Food is chewed by crushing and grinding. Stimulates salivary	Any two correct events/roles (2)	Any one correct events/roles (1)	Some relevant information(0.5)	Wrong answer(0)		

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		glands to secrete saliva. The water and mucous in saliva moistened, softens and lubricate the food Salivary amylase digest starch to maltose Food is rolled by tongue to spherical mass called bolus that is swallowed and enter to esophagus by pharynx etc. (3)						
2(ix)	<b>Lock &amp; key model</b>	Correct explanation mentioning any two criteria like, Name of scientist, enzyme and Substrate with specific shapes. Product formed and escape from active site into surrounding medium. Model explains enzyme specificity, least accepted model etc (2)	Correct explanation of any one criteria and correct label diagram (1)	Some relevant information(0.5)	Wrong answer(0)			
	<b>Diagram of lock and key model</b>	Correct diagram with labels (1)	Some relevant information(0.5)	Wrong answer(0)				
OR	<b>Effect of pH on Enzyme activity.</b>	Correct explanation of any two criteria like Each kind of enzyme works best at particular pH called optimum pH. In stomach enzymes work in acidic medium	Correct explanation of any one criteria (1)	Some relevant information (0.5)	Wrong answer (0)			



Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		and in intestine other enzymes work in alkaline medium. Pepsin work at 2 pH in stomach if pH is much higher or lower than optimum the enzyme denatures. (2)						
	<b>Graph</b>	Correct graph (1)	Partially correct graph (0.5)	Wrong answer (0)				
2(x)	<b>Antigens and antibodies in blood group A</b>	Correct identification of both antigen and antibodies i.e. <u>antigen</u> A and antibody B. (1)	Correct identification of any one (0.5)	Wrong answer (0)				
	<b>Antigens and antibodies in blood group B</b>	Correct identification of both antigen and antibodies i.e. <u>antigen</u> B and antibody A. (1)	Correct identification of any one (0.5)	Wrong answer (0)				
	<b>Antigens and antibodies in blood group O</b>	Correct identification i.e. no <u>antigen</u> and both antibody A and B. (1)	Correct identification of any one (0.5)	Wrong answer (0)				
<b>OR</b>	<b>Summary of the dark reaction in photosynthesis</b>	Correct description mentioning any three criteria like Once the light reactions produces ATP and NADPH, a photosynthetic cell can fix carbon dioxide to build sugar molecules. This path way does not depend directly on light that is why it is called dark reaction or light independent reactions. It takes place in stroma	Description mentioning any two criteria (2)	Description mentioning any one criteria (1)	Some relevant information (0.5)	Wrong answer (0)		

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		of the chloroplast. The reaction consists of three main phases i.e. CO <sub>2</sub> fixation, reduction and regeneration of CO <sub>2</sub> acceptor etc. (3)						
2(xi)	<b>Occurrence of Krebs cycle in matrix of mitochondria</b>	<p>Correct description of Krebs cycle mentioning any three criteria like Krebs cycle takes place in mitochondrial matrix. Coenzyme A is released and acetyl group is passed through a series of reactions. The products of this process are CO<sub>2</sub>, NADH and FADH<sub>2</sub>. Some energy is released to produce ATP directly while more energy will be produced by oxidizing NADH and FADH<sub>2</sub> in ETC. Chemical equation  <math>2 \text{ acetyl CoA} \rightarrow 4 \text{ CO}_2 + 2 \text{ ATP} + 6 \text{ NADH} + 2 \text{ FADH}_2</math> (3)</p>	Partially correct description of Krebs cycle mentioning two criteria with correct chemical equation (2.5)	Correct description of Krebs cycle without chemical equation (2)	Partially correct description / Only correct chemical equation (1)	Some relevant information (0.5)	Wrong answer (0)	
OR	<b>a) Definition of Crossing over</b>	Correct definition i.e. Chromosome segment is exchanged between the two non- sister chromatids of homologous chromosomes at the chiasmata (1)	Some relevant information (0.5)	Wrong answer (0)				

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
	<b>b) Definition of chiasmata</b>	Correct definition i.e. The chromatids of the homologous pair may cross each other and the point of crossing is X shaped.	Some relevant information (0.5)	Wrong answer (0)				
	<b>c) Definition of Synapsis</b>	Correct definition i.e. The homologous chromosomes begins to pair length wise with their homologue. The process of pairing is called synapsis.	Some relevant information (0.5)	Wrong answer (0)				
3	<b>Structure of nucleus</b>	Correct description of nucleus mentioning at least six criteria like rounded shape, nuclear envelope, nuclear pores, nucleoplasm, chromatin, chromosomes, nucleoli etc. (3)	Correct description of any five criteria (2.5)	Correct description of any four criteria (2)	Correct description of any three criteria (1.5)	Correct description of any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)
	<b>Functions of nucleus</b>	Any two correct function such as control all activities of cell, carry hereditary information, ribosome formation etc. (1)	Some relevant information (0.5)	Wrong answer (0)				
	<b>Diagram of Nucleus</b>	Correct diagram with at least four labels (1)	Partially sketched & partially labeled diagram (0.5)	Wrong answer (0)				
OR	<b>Red blood cells (Erythrocytes)</b>	Correct description mentioning any four criteria like, circular flattened, biconcave disc shaped, contain haemoglobin, produced	Correct description mentioning any three criteria (1.5)	Correct description of any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)		

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		in bone marrow, average age 120 days, transport oxygen, destroyed in spleen and liver etc. (2)						
	<b>White blood cells (Leucocytes)</b>	Correct description mentioning any four criteria like, average life 3-4 days, two main types (granulocytes and agranulocytes), further types (neutrophils, eosinophils, basophils, monocytes and lymphocytes), function of each type, defense, immunity etc. (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)		
	<b>Platelets (Thrombocytes)</b>	Correct description mentioning at least two criteria like produced in bone marrow, fragments of megakaryocyte, involved in blood clotting etc. (1)	Some relevant information (0.5)	Wrong answer (0)				
4	<b>Starch-sugar hypothesis</b>	Correct description mentioning at least five criteria like opening of stomata after exposure to light due to synthesis of sugar, conversion of starch into sugar, increase in sugar concentration, absorbing water by osmosis, increase in turgor pressure, more curved	Correct description mentioning at least four criteria (2)	Correct description mentioning at least three criteria (1.5)	Correct description mentioning at least two criteria (1)	Some relevant information (0.5)	Wrong answer (0)	

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		guard cells, during darkness conversion of sugar to starch, decrease in sugar concentration, outward movement of water, less curved guard cells closing stomata etc (2.5)						
	<b>Influx of potassium ions hypothesis</b>	Correct description mentioning at least five criteria such as day light stimulates the influx of potassium ions from surrounding cells into guard cells, increased concentration in guard cells, entry of water by osmosis, increased turgor pressure, turgid and more curved shape of guard cells resulting in opening of stomata; in darkness potassium leave out of guard cell, followed by exosmosis of water resulting in flaccid and changed guard cells that closes stomata etc. (2.5)	Correct description mentioning at least four criteria (2)	Correct description mentioning at least three criteria (1.5)	Correct description mentioning at least two criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
OR	<b>Structure of stomach</b>	Correct description mentioning any six criteria like, J-shaped, muscular with three muscle layers, mucosa, cardiac sphincter, cardiac end, pyloric end, pyloric sphinture, gastric glands	Correct description mentioning any five criteria (2.5)	Correct description mentioning any four criteria (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any one criteria (1)	Some relevant information (0.5)	Wrong answer (0)

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		etc. (3)						
	<b>Diagram of stomach</b>	Correct diagram with at least six labels like cardiac sphincter, cardiac end, mucosa, muscle layers, pyloric end, pyloric sphincter etc. (2)	Correct diagram with at least four labels (1.5)	Correct diagram with two labels (1)	Some relevant diagram (0.5)	Wrong answer (0)		
5	<b>Definition of fertilizer</b>	Correct definition/introduction of fertilizer i.e. substances added to soil for providing nutrients to plants. (1)	Incomplete definition. (0.5)	Wrong answer (0)				
	<b>Types of fertilizers</b>	Correct description mentioning the two types i.e. organic fertilizers derived from plants and animals and inorganic fertilizers obtained from non-living sources or prepared industrially. (2)	Incomplete description (1)	Some relevant information (0.5)	Wrong answer (0)			
	<b>Environmental hazards of fertilizers</b>	Correct description mentioning at least four hazards like increasing acidity of soil, increased rate of pest reproduction, salinity, water/air pollution, hardened soil, release of greenhouse gases etc. (2)	Correct description mentioning at least three hazards (1.5)	Correct description mentioning at least two hazards (1)	Some relevant information (0.5)	Wrong answer (0)		
<b>OR</b>	<b>Definition/ introduction of epithelial tissue</b>	Correct definition/introduction of epithelial tissue i.e. a	Incomplete definition. (0.5)	Wrong answer (0)				

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		tissue composed of closely packed animal cells forming the outer layer of organs or inner lining of tubular organs. (1)						
	<b>Types of epithelial tissue</b>	Correct description of any four types of epithelial tissue like squamous epithelium, cuboidal epithelium, columnar epithelium, ciliated epithelium, stratified epithelium (4)	Correct description of any three types of epithelial tissue (3)	Correct description of any two types of epithelial tissue (2)	Correct description of any one types of epithelial tissue (1)	Some relevant information (0.5)	Wrong answer (0)	
6	<b>Definition of anaerobic respiration</b>	Correct definition/introduction of anaerobic respiration i.e. respiration without oxygen resulting in incomplete oxidation of glucose (1)	Incomplete definition. (0.5)	Wrong answer (0)				
	<b>Types of anaerobic respiration</b>	Correct description of the two types i.e. alcoholic fermentation and lactic acid fermentation showing chemical equations (2)	Correct description of the two types without showing chemical equations (1)	Some relevant information (0.5)	Wrong answer (0)			
	<b>Importance of anaerobic respiration</b>	Correct description mentioning at least four points like, source of energy for early organisms, source of energy for plants and animals during deficiency of oxygen, bread making, synthesis of alcohol (brewing), milk curding	Correct description mentioning at least three points (1.5)	Correct description mentioning at least two points (1)	Some relevant information (0.5)	Wrong answer (0)		

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		etc. (2)						
OR	<b>Definition of binomial nomenclature</b>	Correct definition/introduction of binomial nomenclature i.e. the system of naming in which each type of organism is given a name consisting of two parts (genus and species) (1)	Incomplete definition(0.5)	Wrong answer (0)				
	<b>Significance of binomial nomenclature</b>	Correct description mentioning at least two significances like a complete list of all organisms, different languages have different names for same organisms, same name may indicate different organisms, common name have no scientific base, confusing names etc. (2)	Correct description mentioning at least one significance (1)	Some relevant information (0.5)	Wrong answer (0)			
	<b>Rules of binomial nomenclature</b>	Correct description mentioning at least four rules like First name is genus, second name is species, first letter of genus is capital, all letters of species are small, both name italicized or underlined separately, genus name abbreviated to first letter if understood and repeatedly written etc. (2)	Correct description mentioning at least three rules (1.5)	Correct description mentioning at least two rules (1)	Some relevant information (0.5)	Wrong answer (0)		



