

RUBRICS: SSC II 1st ANNUAL EXAMINATION 2024
SUBJECT: BIOLOGY-II (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)	Levels of ecological organization : Level 1	Correct name of ecological level i.e Habitat. (0.5)	Wrong answer (0)					
	Level 2	Correct name of ecological level i.e Species . (0.5)	Wrong answer (0)					
	Level 3	Correct name of ecological level i.e Population. (0.5)	Wrong answer (0)					
	Level 4	Correct name of ecological level i.e Community. (0.5)	Wrong answer (0)					
	Level 5	Correct name of ecological level i.e Ecosystem. (0.5)	Wrong answer (0)					
	Level 6	Correct name of ecological level i.e Biosphere. (0.5)	Wrong answer (0)					
OR	Sources of Variations: .	Correct description explaining any three sources of variation like, crossing over, Independent assortment, Mutation, Gene flow, Fertilization in which one of the millions of sperms combines with an egg. (03)	Any two correct sources of variation. (02)	Any one correct source of variation. (01)	Some relevant information. (0.5)	Wrong answer (0)		
2(ii)	Rate of breathing at rest:	Correct description of the rate of breathing, 15-20 times per minute under resting condition. Medulla oblongata has respiratory center that detect the concentration of CO ₂ in the blood which is a basic stimulus to control the rate of breathing (1.5)	Partially correct description. (1)	Some relevant information. (0.5)	Wrong answer(0)			
	Rate of breathing after exercise:	Correct description of the breathing rate during exercise we need more energy which is provided by more	Partially correct description. (1)	Some relevant	Wrong answer(0)			

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OR		and more oxidation of glucose. As a result more CO ₂ is produced during exercise. For this purpose expiration takes place at an increased rate and rate of respiration becomes 30-40 times per minute etc. (1.5)		information. (0.5)				
	Artificial vegetative propagation: <u>Stem cutting:</u>	Description showing any three correct characteristics. Like, stems are cut obliquely. The cut must have nodes and buds. Removal of leaves from cutting to avoid transpiration. e.g, rose, sugar cane etc (1.5)	Description showing any two correct characteristics. (1)	Description showing any one correct characteristic. (0.5)	Wrong answer(0)			
	Artificial vegetative propagation: <u>Grafting::</u>	Description showing any three correct characteristics. like, a piece of shoot (scion) from one plant is inserted under the bark on the stem (stock) of another closely related variety. The scion grows and retains all its qualities while the stock support it. Two types, bud grafting and stem grafting. e.g, guava, peach, plum, seedless grapes etc. (1.5)	Description showing any two correct characteristics. (1)	Description showing any one correct characteristic. (0.5)	Wrong answer(0)			
2(iii)	Endosperm	Description showing any three correct criteria. like Endosperm is triploid (3n) structure formed by the fusion of two polar nuclei and one sperm nucleus. It divides, enlarges and store the food for young embryo etc. (1.5)	Description showing any two correct criteria. (1)	Description showing any one correct criteria. (0.5)	Wrong answer(0)			

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	Pollen tube nucleus:	Description showing any three correct criteria. like Pollen tube nucleus is a structure inside pollen tube along with generative nucleus. The generative nucleus later divides to form two sperms. The pollen tube nucleus and two sperms are the parts of male gametophyte etc. (1.5)	Description showing any two correct criteria. (1)	Description showing any one correct criteria. (0.5)	Wrong answer(0)			
OR	Name of part A of human brain:	Correct name. i.e Medulla oblongata (0.5)	Wrong name. (0)					
	Function of part A:	One correct function i.e It controls voluntary processes of body like heartbeat, blood pressure and respiration. (0.5)	Wrong function. (0)					
	Name of part B:	Correct name. i.e Cerebrum (0.5)	Wrong name. (0)					
	Function of part B:	One correct function .i.e (hearing, sight, smell, memory, voluntary actions, intelligence, reasoning etc 0.5)	Wrong function. (0)					
	Name of part C:	Correct name. i.e. Cerebellum (0.5)	Wrong name. (0)					
	Function of part C:	One correct function. i.e Balance and muscle coordination (0.5)	Wrong function. (0)					
2(iv)	Difference between respiration and breathing: <u>Respiration:</u>	Description showing any three correct characteristics like, the process by which chemical energy in organic molecules is released by oxidation. This energy is then made available to the cells in the form of ATP. The respiration within cell is called cellular respiration. Two types, aerobic and anaerobic. (1.5)	Description showing any two correct characteristics. (1)	Description showing any one correct characteristic. (0.5)	Wrong answer(0)			
	<u>Breathing:</u>	Description showing any three	Description	Description				

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		correct characteristics like, it is a physical process. It causes movement of air in and out of the breathing surface i.e, lungs. Two phases, inspiration and expiration. (1.5)	showing any two correct characteristics. (1)	showing any one correct characteristic. (0.5)	Wrong answer(0)			
OR	Description of Negative feedback:	Description showing three correct characteristics like, the output of the process inhibits the process. It maintain homeostasis. It returns conditions to the normal. It is more common in living organisms (1.5)	Description showing two correct characteristics. (1)	Description showing one correct characteristic. (0.5)	Wrong answer(0)			
	Negative feedback with reference to Insulin or Glucagon:	Correct description of Insulin OR Glucagon in negative feedback mechanism i.e When blood glucose level is raised, insulin is secreted. It stimulates the absorption and storage of glucose as glycogen in liver and muscles. This causes blood glucose level to returns to its normal level. This normal blood glucose level is output of the process which inhibits further insulin secretion OR Glucagon negative feedback role. (1.5)	Partially correct description of Insulin OR Glucagon in negative feedback mechanism. (1)	Some relevant information. (0.5)	Wrong answer(0)			
2(v)	Causes of kidney failure:	Any three correct causes of kidney failure like, Diabetes, high blood pressure, kidney infections, kidney stones and glomerular blockage. (3)	Any two correct causes of kidney failure. (2)	Any one correct cause of kidney failure. (1)	Some relevant information. (0.5)	Wrong Answer. (0)		

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OR	Composition of chromatin material:	Correct description of composition showing DNA + histone, nucleosome , linker DNA etc. (3)	Partially correct description showing any two criteria. (2)	Any one point of the composition of chromatin. (1)	Some relevant information. (0.5)	Wrong Answer. (0)		
2(vi)	Difference between continuous and discontinuous variation: <u>Continuous variation :</u>	Correct description of continuous variations mentioning any three criteria such as Deals with a spectrum of measurable phenotypes ranging from one extreme to the other. Controlled by many genes which show additive effect. Modified by environmental conditions etc. Examples are skin, height, intelligence(IQ), weight etc. (1.5)	Correct description of continuous variations mentioning any two criteria. (1)	Correct description of continuous variations mentioning any one criteria. (0.5)	Wrong answer (0)			
	<u>Discontinuous variation:</u>	Correct description of discontinuous variations mentioning any three criteria such as Deals with a few clear cut phenotypes with no intermediate forms which cannot be measured. Controlled by alleles of single gene pair. Not modified by environmental changes etc. Examples are ABO blood groups, tongue rolling etc. (1.5)	Correct description of discontinuous variations mentioning any two criteria. (1)	Correct description of discontinuous variations mentioning any one criterion. (0.5)	Wrong answer (0)			
OR	Three types of cartilage: <u>Hyaline cartilage:</u>	Correct name and description of hyaline cartilage i.e Flexible, found at the ends of long bones, nose, larynx and trachea. (1)	Some relevant information. (0.5)	Wrong answer (0)				

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	<u>Fibrocartilage:</u>	Correct name and description of fibrocartilage i.e it has thick collagen fibres found in the intervertebral disc. (1)	Some relevant information. (0.5)	Wrong answer (0)				
	<u>Elastic cartilage:</u>	Correct name and description of elastic cartilage i.e More flexible than hyaline cartilage mostly having elastin fibres. It is found in the ear flaps and epiglottis. (1)	Some relevant information. (0.5)	Wrong answer (0)				
2(vii)	Use of restriction endonuclease in genetic engineering:	Correct description of restriction endonuclease in genetic engineering i.e restriction endonuclease enzyme(cutting enzyme) cuts both kinds of DNA (donor DNA and plasmid DNA) into pieces at special sequence.(1.5)	Partially correct description of restriction endonuclease in genetic engineering. (1)	Some relevant information.(0.5)	Wrong answer (0)			
	Use of DNA ligase in genetic engineering:	Correct description of DNA ligase in genetic engineering i.e DNA ligase(joining enzyme) is used to make bond between two types of DNA to form a recombinant DNA. (1.5)	Partially correct description of DNA ligase in genetic engineering. (1)	Some relevant information.(0.5)	Wrong answer (0)			
OR	Improvement in the yields of plants by artificial selection:	Correct description of artificial selection in increasing plant yield mentioning any three criteria like, Artificial selection also called selective breeding is used to produce plants with desired traits and farmers have been doing this for centuries. They often select traits that will make the plants grow faster, grow larger and resistant to drought etc. (3)	Correct description of artificial selection in increasing plant yield mentioning any two criteria. (2)	Correct description of artificial selection in increasing plant yield mentioning any one criterion. (1)	Some relevant information (0.5)	Wrong answer. (0)		

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2(viii)	Correction of long sightedness:	Correct name of lens i.e it can be corrected by using convex lens.. (1.5)	Wrong answer (0)					
	Correction of short sightedness:	Correct name of lens i.e it can be corrected by using concave lens of specific divergence. (1.5)	Wrong answer (0)					
OR	Role of kidney in urine formation:	Correct description of the role of kidney in urine formation i.e Urea is the main nitrogenous waste material in the urine of man. Urea is formed in the liver and is carried to the kidney. The function of kidney is to remove urea and form urine. It involves three processes in the nephron; Pressure or glomerular filtration, tubular or selective reabsorption and tubular secretion. (3)	Partially correct description of the role of kidney in urine formation. (2)	Some relevant information. (1)	Wrong answer (0)			
2(ix)	Causes of land pollution:	Correct description of any three causes of land pollution such as Agricultural wastes, Acid rain, mining wastes, industrial wastes, garbage, construction wastes, deforestation etc. (3)	Correct description of any two causes of land pollution. (2)	Correct description of any one cause of land pollution. (1)	Some relevant information. (0.5)	Wrong answer (0)		
OR	Binary fission in invertebrates:	Correct description mentioning whole process of binary fission in invertebrates i.e Some invertebrates reproduce through binary fission. Their body splits in to two halves and the missing body parts are regenerated and become complete organism OR correct diagram showing binary fission in	Partially correct description mentioning incomplete process of binary fission in invertebrates. (1)	Some relevant information (0.5)	Wrong answer (0)			

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		Planaria. (2)						
	Example:	Correct example like Planaria (1)	Wrong answer. (0)					
2(x)	Antibiotic resistance in bacteria:	Correct description of antibiotic resistance in bacteria mentioning any three criteria such as, when bacteria are exposed to same antibiotic for a long time, they acquire resistance against that antibiotic. Antibiotic resistance is accelerated by the misuse and overuse of antibiotics. Bacteria may acquire resistance in one of two ways: (a) Mutation (b) Transfer of resistance from one bacteria to another through transfer of plasmid during conjugation etc. (3)	Correct description of antibiotic resistance in bacteria mentioning any two criteria. (2)	Correct description of antibiotic resistance in bacteria mentioning any one criterion. (1)	Some relevant information. (0.5)	Wrong answer. (0)		
OR	Procedure of grafting:	Correct description of grafting such as, a piece of shoot (scion) from one plant is inserted under the bark on the stem (stock) of another closely related variety. The scion grows and retains all its qualities while the stock supports it. Two types, bud grafting and stem grafting. E.g, guava, peach plum, seedless grapes etc. (3)	Partially correct description of grafting.(2)	Some relevant information. (1)	Wrong answer. (0)			
2(xi)	Comparison of diabetes insipidus and diabetes mellitus: <u>Diabetes insipidus:</u>	Correct description mentioning the name of hormone and effect of this disease in body i.e this disease is caused due to the under secretion of antidiuretic hormone (Vasopressin). It results in large quantity of dilute urine. (1.5)	Correct mentioning of hormone name OR effect of this disease in body. (1)	Some relevant information. (0.5)	Wrong answer (0)			

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	<u>Diabetes mellitus:</u>	Correct description mentioning the name of hormone and effect of this disease in body i.e this disease is caused when beta cells of pancreas do not produce enough insulin. This results in the accumulation of glucose in blood and is excreted in urine. (1.5)	Correct mentioning of hormone name OR effect of this disease in body. (1)	Some relevant information. (0.5)	Wrong answer (0)			
OR	Strategies for conservation of nature:	Any three Correct strategies for conservation of nature like, Make people aware about the concept of 4 R's (Reduce, Reuse, Recycle, Recover), Less and wise use of natural resources, plantation of trees, More use of Renewable resources, Use of bio-degradable materials etc (3)	Any two Correct strategies for conservation of nature. (2)	Any one Correct strategy for conservation of nature. (1)	Some relevant information. (0.5)	Wrong answer. (0)		
3	Spermatogenesis in rabbit	Correct description of spermatogenesis in rabbit mentioning at least three criteria like, diploid cells in testis develop into primary spermatocytes, meiosis I resulting into two haploid secondary spermatocytes, meiosis II in both secondary spermatocytes form four spermatids, complete morphological transformation change spermatids into sperms etc . (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)			
	Diagram of spermatogenesis in rabbit	Correct diagram with all labels (1)	Correct diagram with no labels (0.5)	Wrong answer (0)				

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	Oogenesis in rabbit	Correct description of oogenesis in rabbit mentioning at least three criteria like, diploid oogonia cells in ovary increase in size and develop into primary oocytes, meiosis I resulting into two haploid cells of unequal size, the smaller one first polar body and the larger one secondary oocyte, meiosis II in the secondary oocytes form one larger ovum and a smaller second polar body etc . (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)			
	Diagram of oogenesis in rabbit	Correct diagram with all labels (1)	Correct diagram with no labels (0.5)	Wrong answer (0)				
OR	Excretion mechanism of CO₂ and water in plants	Correct description mentioning the criteria like, the consumption of CO ₂ produced by respiration in photosynthesis during day time, removal of extra CO ₂ through stomata and lenticels during night, removal of extra water by transpiration through stomata and lenticels during day time, removal of water as droplets in some herbaceous plants by guttation etc. (2.5)	Correct description with some points missing (2)	Description of any one method of removal of CO ₂ and one of water OR description of two methods of removal of either CO ₂ or water (1)	Some relevant information(0.5)	Wrong answer (0)		
	Excretion mechanism of latex and gums	Correct description mentioning the criteria like, some plants produce wastes as latex or gum, produced in specialized cells or glands, remain in ducts/canals, come out after	Correct description with some points missing (2)	Description of any one method of removal of either latex with example or	Some relevant information(0.5)	Wrong answer (0)		

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		injury, latex produced by rubber plant and gums by keekar etc. (2.5)		gums with example (1)				
4	Process of gene transplantation	<p>Correct description explaining all basic steps of gene transplantation like,</p> <ol style="list-style-type: none"> 1. Isolation of the gene of interest 2. Vector selection 3. Restriction endonucleases 4. Transfer of recombinant DNA into host 5. Growth of GMO 6. Expression of the gene <p>OR complete labeled diagram (5)</p>	<p>Correct description missing any one step OR</p> <p>Diagram with some parts missing (4)</p>	<p>Description explaining at least three basic steps OR</p> <p>Half complete diagram (3)</p>	<p>Listing all the steps without explanation OR unlabeled diagram (2)</p>	<p>Incomplete list of the steps without explanation (1)</p>	<p>Some relevant information (0.5)</p>	<p>Wrong answer (0)</p>
OR	Any five sources of drugs: First source	<p>Correct description mentioning any one among the six sources i.e Animals, plants, fungi, bacteria, minerals and synthetic drugs with correct examples (1)</p>	<p>Description with no example or correct example with no description (0.5)</p>	<p>Wrong answer (0)</p>				
	Any five sources of drugs: Second source	<p>Correct description mentioning any one among the six sources i.e Animals, plants, fungi, bacteria, minerals and synthetic drugs with correct examples (1)</p>	<p>Description with no example or correct example with no description (0.5)</p>	<p>Wrong answer (0)</p>				
	Any five sources of drugs: Third source	<p>Correct description mentioning any one among the six sources i.e Animals, plants, fungi, bacteria,</p>	<p>Description with no example or correct example</p>	<p>Wrong answer (0)</p>				

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		minerals and synthetic drugs with correct examples (1)	with no description (0.5)					
	Any five sources of drugs: Fourth source	Correct description mentioning any one among the six sources i.e Animals, plants, fungi, bacteria, minerals and synthetic drugs with correct examples (1)	Description with no example or correct example with no description (0.5)	Wrong answer (0)				
	Any five sources of drugs: Fifth source	Correct description mentioning any one among the six sources i.e Animals, plants, fungi, bacteria, minerals and synthetic drugs with correct examples (1)	Description with no example or correct example with no description (0.5)	Wrong answer (0)				
5	Mutualism	Correct description of mutualism mentioning the criteria like, definition, correct explanation of examples like pollinating insects and flowering plants, protozoan in termites gut, nitrogen fixing bacteria and leguminous plants, etc. (2.5)	Correct description of mutualism with some information missed (2)	Correct definition of mutualism mentioning at least one example (1)	Some relevant information (0.5)	Wrong answer (0)		
	Commensalism	Correct description of commensalism mentioning the criteria like, definition, explanation of correct examples like epiphyte plants, sucker fish attached to sharks and whales etc. (2.5)	Correct description missing some point (2)	Correct definition with one example (1)	Some relevant information (0.5)	Wrong answer (0)		
OR	Pupil reflex in dim light	Correct description of pupil reflex in dim light explaining, contraction and relaxation of muscles in the iris, changes in diameter of pupil, involvement of two sets of muscles i.e	Correct description of pupil reflex in dim light mentioning with some	Correct description of pupil reflex in dim light mentioning at least three	Correct description of pupil reflex in dim light mentioning at	Some relevant information (0.5)	Wrong answer (0)	

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		radial muscles and circular muscles, in dim light the radial muscles contract and circular muscles relax, increasing diameter of pupil, allowing more light to enter into eye, diagram etc . (2.5)	information missing (2)	criteria (1.5)	least one criteria (1)			
	Pupil reflex in bright light	Correct description of pupil reflex in bright light explaining, contraction and relaxation of muscles in the iris, changes in diameter of pupil, involvement of two sets of muscles i.e radial muscles and circular muscles, in bright light the circular muscles contract and radial muscles relax, decreasing diameter of pupil, letting less light to enter into eye, diagram etc . (2.5)	Correct description of pupil reflex in bright light with some information missing (2)	Correct description of pupil reflex in bright light mentioning at least three criteria (1.5)	Correct description of pupil reflex in bright light mentioning at least one criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
6	Difference between tendons and ligaments	Correct description highlighting the difference between tendons and ligaments like, tendons are tough bands of connective tissues, composed of collagen that attach muscles with the bones while ligaments are strong but flexible bands of connective tissue that join one bone to another at joints. diagram etc. (2.5)	Correct description highlighting the difference between tendons and ligaments missing some information (2)	Correct description of either tendons or ligaments (1)	Some relevant information. (0.5)	Wrong answer (0)		
	Role of tendons and ligaments in human skeleton	Correct description of the role of tendons and ligaments in human skeleton like, contraction of muscle exert pulling force through tendons on attached bones causing their	Correct description of the role of either tendons or ligaments (1)	Some relevant information (0.5)	Wrong answer (0)			

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		movement, ligaments prevent dislocation of bones at joints etc. (2.5)						
OR	Composition of inspired air	Correct composition of inspired air for at least five components among oxygen, carbon dioxide, nitrogen, water vapours, temperature and dust particles. (2.5)	Correct composition of inspired air for at least four components (2)	Correct composition of inspired air for at least three components (1.5)	Correct composition of inspired air for at least two components (1)	Some relevant information (0.5)	Wrong answer (0)	
	Composition of expired air	Correct composition of expired air for at least five components among oxygen, carbon dioxide, nitrogen, water vapours, temperature and dust particles. (2.5)	Correct composition of expired air for at least four components (2)	Correct composition of expired air for at least three components (1.5)	Correct composition of expired air for at least two components (1)	Some relevant information (0.5)	Wrong answer (0)	

RUBRICS: SSC 1st ANNUAL EXAMINATION 2024
SUBJECT: BIOLOGY-II (Local)

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2(i)	Any six Steps of Carbon cycle (1st Step)	Correct explanation that is Absorption of CO ₂ from air----- photosynthesis (0.5)	Wrong answer(0)					
	Any six Steps of Carbon cycle (2nd Step)	Correct explanation that is Carbon moves from plants to animals---- food chain (0.5)	Wrong answer(0)					
	Any six Steps of Carbon cycle (3rd Step)	Correct explanation that is organisms remove CO ₂ ----respiration (0.5)	Wrong answer(0)					
	Any six Steps of Carbon cycle (4th Step)	Correct explanation that is organismic decomposition release CO ₂ (0.5)	Wrong answer(0)					
	Any six Steps of Carbon cycle (5th Step)	Correct explanation that is dead organisms ----becomes fossils fuel (0.5)	Wrong answer(0)					
	Any six Steps of Carbon cycle (6th Step)	Correct explanation that is fossils fuel burned--- co ₂ enter the air (0.5)	Wrong answer(0)					
OR	Mendel's law of segregation	Correct statement i.e Traits of organisms determined by two alleles which separate in gametes and reunite again at fertilization.(2)	Partially Correct explanation of law (1)	Some relevant information(0.5)	Wrong answer(0)			
	Example	Correct description cross between seed shape (round and wrinkled) plant height (tall and Short) OR just show through cross without describing.(1)	Some relevant information(0.5)	Wrong answer(0)				
2(ii)	Gaseous exchange in leaf through stomata	Correct explanation that through stomata of leaves (O ₂ and CO ₂) (1)	Some relevant information(0.5)	Wrong answer(0)				
	Gaseous exchange in leaf through cuticle	Correct explanation that through cuticle of leaves (O ₂ and CO ₂) (1)	Some relevant information(0.5)	Wrong answer(0)				
	Gaseous exchange in leaf through air spaces inside leaf	Correct explanation that through Air spaces between the spongy mesophyll cells of leaves (O ₂ and CO ₂) (1)	Some relevant information(0.5)	Wrong answer(0)				

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OR	External fertilization	Correct explanation of external fertilization i.e. male and female gametes release in water--- fertilization of egg in water, examples fish, frogs etc (1.5)	Correct explanation of external fertilization without examples (1)	Some relevant information(0.5)	Wrong answer(0)			
	Internal fertilization	Correct explanation of internal fertilization i.e. male and female gametes fuse inside reproductive tract of female.—development external for examples lizards birds etc / internal development examples mammals--- horse, man, monkey etc(1.5)	Correct explanation of internal fertilization without examples (1)	Some relevant information(0.5)	Wrong answer(0)			
2(iii)	Any three characteristics of insect pollinated flowers	Correct explanation of any three features that is, large and bright petals, scented with nectars, moderate number of pollen grains, sticky pollen grains, anthers and stigma inside flowers, etc (03)	Correct explanation showing any two features (2)	Correct explanation of any one feature (1)	Some relevant information(0.5)	Wrong answer(0)		
OR	Correct functions of given parts of ear (Cochlea)	Correct function of Cochlea; is coiled like a snail shell and has sound receptors (1)	Some relevant information(0.5)	Wrong answer (0)				
	Correct functions of given parts of ear (Vestibule)	Correct function Vestibule; can detect any change in the position of the body. (1)	Some relevant information(0.5)	Wrong answer (0)				
	Correct functions of given parts of ear (Round window)	Correct function of Round window; it links inner ear to middle ear. (1)	Some relevant information(0.5)	Wrong answer (0)				
2(iv)	Role of lungs in gaseous exchange	Correct explanation about the role of lungs like; lungs are spongy due to alveoli surrounded by blood capillaries, moist inner surface, exchange of gases(O ₂ and CO ₂) between alveolus and blood capillaries by diffusion. (3)	Partially Correct explanation (2)	Some relevant information(1)	Wrong answer(0)			

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OR	Path of nerve impulse (reflex arc)	Correct sequence of different parts in the path of nerve impulse (reflex arc) that are, sense organ (receptor), sensory neuron, interneuron(spinal cord or brain), motor neuron, effectors (muscles or glands) OR correct diagram with labeling (3)	Correct sequence of any four parts OR partially correct diagram with any four labeling (2.5)	Correct sequence of any three parts OR partially correct diagram with any three labelings (2)	Correct sequence of any two parts OR partially correct diagram with any two labelings (1.5)	Correct name of any one component OR diagram with any one labeling(1)	Wrong answer (0)	
2(v)	Osmoregulatory functions of kidney	Correct description of osmoregulatory function of kidney that is if blood is dilute, less water is reabsorbed from renal tubules leaving more water to enter the bladder leads to form dilute (hypotonic) urine. If blood is concentrated , more water is absorbed back into the blood from kidney tubule and it leads to concentrated urine(hypertonic) (3)	Partially Correct description of any two events (2)	Partially Correct description of any one event (1)	Some relevant information(0.5)	Wrong answer(0)		
OR	Sources of variations	Any three Correct sources of variations like; crossing over, mutation, independent assortment, gene flow, fertilization of one of the millions of sperms with one egg.(3)	Any two Correct sources of variations (2)	Any one Correct source of variations (1)	Some relevant information(0.5)	Wrong answer (0)		
2(vi)	Incomplete Dominance	Correct definition of incomplete dominance that is ; it is heterozygous interaction in which both alleles express in such a way that phenotype of heterozygote is blend of two homozygotes.(1)	Partially correct definition (0.5)	Wrong answer(0)				
	4' O clock plant as an example of Incomplete Dominance	Correct explanation of cross between red and white flowers plant to produce pink flowers (F1 generation and also discuss F2 generation OR Correct cross showing incomplete dominance.(2)	Partially Correct explanation of cross between red and white flowers plant to produce pink flowers (F1 generation and also discuss F2 generation	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 Correct cross showing incomplete dominance .(1)					
OR	Bone	Any three Correct features of bone like rough and tough, presence of blood vessels, bone marrow present, matrix made up of protein and mineral salts, two types compact and spongy bone etc. (1.5)	Any two Correct features of bone (1)	Any one Correct feature of bone (0.5)	Wrong answer(0)			
	Cartilage	Any three Correct features of cartilage like flexible and elastic, absence of blood vessels, bone marrow absent, matrix made up of protein only, three types hyaline, elastic and fibro cartilage etc. (1.5)	Any two Correct features of cartilage (1)	Any one Correct feature of cartilage (0.5)	Wrong answer(0)			
2(vii)	Importance of biotechnology in any one field	Correct description mentioning importance of biotechnology in any one field among: medicine ; Insulin, human growth hormone, vaccines, gene therapy etc Agriculture ;increased crop yields, reduce need for pesticides, enhanced nutrients composition, food quality, herbicide resistant plants etc Solving environmental problems ; cleaning up oil spills, soil contamination, water pollution, plastic eating bacteria, biodegradable plastics etc (1.5)	Correct description with some information missing (1)	Some relevant information(0.5)	Wrong answer(0)			
	Importance of biotechnology in any other field	Correct description mentioning importance of biotechnology in any other field among:	Correct description with some information missing (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)	
		<p>medicine; Insulin, human growth hormone, vaccines, gene therapy etc</p> <p>Agriculture;increased crop yields, reduce need for pesticides, enhanced nutrients composition, food quality, herbicide resistant plants etc</p> <p>Solving environmental problems; cleaning up oil spills, soil contamination, water pollution, plastic eating bacteria, biodegradable plastics etc (1.5)</p>						
OR	Composition of chromatin	<p>Correct description mentioning composition of chromatin like; present in non-dividing cell, mainly composed of coils of DNA bound to basic proteins called histones, two turns of DNA around each octet of histones formed beads like structures called nucleosomes, a small segment of DNA between two consecutive nucleosomes is called linker DNA. etc (3)</p>	<p>Partially correct description mentioning any two correct features (2)</p>	<p>Partially correct description mentioning any one correct feature (1)</p>	<p>Some relevant information(0.5)</p>	<p>Wrong answer(0)</p>		
2(viii)	Role of Vitamin A in vision	<p>Correct explanation that is ; in rods cells of retina vitamin A reacts with a protein called opsin to form rhodopsin. Rhodopsin in rods is necessary for dim light vision. Vit A deficiency leads to night blindness etc. (3)</p>	<p>Partially correct explanation (2)</p>	<p>Some relevant information(1)</p>	<p>Wrong answer(0)</p>			
OR	Glomerulus filtration in Kidney	<p>Correct explanation that is; The movement of small molecules across the glomerular wall as result of blood pressure. When blood enters the glomerulus, blood pressure sufficient to cause small molecules such as water , nutrients, salts and wastes to move from the glomerulus to the inside of bowman’s capsule. This fluid is</p>	<p>Partially correct explanation (2)</p>	<p>Some relevant information(1)</p>	<p>Wrong answer (0)</p>			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	
		called glomerular filterate.Big molecules such as blood proteins and blood cells remain in the blood.. (3)						
2(ix)	Host	Correct description of host; the organisms that provide food and shelter to the parasites in parasitism.e.g Human, cows, dogs ,plants etc (1.5),	Correct definition of host without example (1)	Some relevant information (0.5)	Wrong answer (0)			
	Parasite	Correct description of parasite; the organisms that get food and shelter from the host and in turns harms it in parasitism.e.g leech, lice, tapeworms, liver fluke ,plasmodium etc (1.5)	Correct definition of parasite without example (1)	Some relevant information (0.5)	Wrong answer (0)			
OR	Control of pollution	Correct description mentioning any three criteria like ; less and wise use of natural resources, solid waste management, bio fertilizers, 4R's , planting trees, use of biodegradable materials and renewable resources etc (3)	Description mentioning any two criteria (2)	Description mentioning any one criteria (1)	Some relevant information (0.5)	Wrong answer (0)		
2(x)	Importance of Adrenaline in chemical coordination	Correct description of Adrenaline ; secreted by adrenal glands to meet emergency situation (fight and flight, also secreted during fear and anxiety. It decreases the rate of heart beat, blood pressure and blood flow to limbs. (1)	Partially correct description of adrenaline (0.5)	Wrong answer (0)				
	Importance of Parathormone in chemical coordination	Correct description of Parathormone ; secreted by parathyroid gland. It has function opposite to the function of calcitonin. It controls the balance of Ca ++and phosphate in the body(1)	Partially correct description of parathormone. (0.5)	Wrong answer (0)				
	Importance of Thyroxin in chemical coordination	Correct description of Thyroxin ; secreted by thyroid gland. It regulates basic metabolism. It regulates process of growth specially maturation, mental	Partially correct description of thyroxin. (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 skeletal development in children etc (1)						
OR	Name and functions of given parts of seed (Part A)	Correct name and function of part A Plumule ; it develops into new shoot/stem (1)	Correct name OR function of part A (0.5)	Wrong answer (0)				
	Name and functions of given parts of seed (Part B)	Correct name and function of part B Cotyledon ; it store food (1)	Correct name OR function of part B (0.5)	Wrong answer (0)				
	Name and functions of given parts of seed (Part C)	Correct name and function of part C Hilum ; it is the attachment part of the seed. OR Radicle , it develops into new root (1)	Correct name OR function of part C (0.5)	Wrong answer (0)				
2(xi)	Narrow spectrum antibiotics	Correct description of narrow spectrum antibiotics that is; these antibiotics acts against limited variety of bacteria e.g. penicillin etc . (1.5)	Partially correct description of narrow spectrum antibiotic (1)	Some relevant information (0.5)	Wrong answer (0)			
	Broad spectrum antibiotics	Correct description of broad spectrum antibiotics that is; these antibiotics acts against wide range of bacteria e.g. tetracycline etc (1.5)	Partially correct description of broad spectrum antibiotic (1)	Some relevant information (0.5)	Wrong answer (0)			
OR	Parthenogenesis as asexual reproduction	Correct description of parthenogenesis that is; a type of asexual reproduction in which unfertilized egg develops into new off spring's. (2)	Partially Correct description (1)	Some relevant information(0.5)	Wrong answer (0)			
	Example of Parthenogenesis	Any one example of parthenogenesis such as fishes, frog, and insects (honey bees) (1)	Wrong answer (0)					
3	Binary fission in prokaryotes	Correct description of binary fission in bacteria mentioning at least three criteria like, the duplication of chromosomes, separation of chromosomes, division of cell into two, growth, division repeated etc . (1.5)	Correct description mentioning 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)	
	Diagram of binary fission in bacteria	Correct diagram with all labels (1)	Correct diagram with no labels (0.5)	Wrong answer (0)				
	Binary fission in eukaryotes	Correct description of binary fission in Amoeba mentioning at least three criteria like, the division of nucleus by mitosis, followed by division of cell into two, identical daughter cells produced, growth, division repeated etc . (1.5)	Correct description mentioning any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)			
	Diagram of binary fission in Amoeba	Correct diagram with all labels (1)	Correct diagram with no labels (0.5)	Wrong answer (0)				
OR	Bending of arm	Correct description mentioning any five criteria like, location of elbow joint, biceps muscle in front of humerus, two origins on shoulder blade, single tendon as insertion on radius, biceps as flexor muscle, its contraction cause bending (Flexion), pulling arm upward, labeled diagram etc. (2.5)	Correct description mentioning 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)	
	Straightening of arm	Correct description mentioning any five criteria like, location of elbow joint, triceps muscle lie behind humerus, three origins two on shoulder blade and one on humerus, single tendon as insertion on ulna, triceps as extensor muscle, its contraction cause straightening (extension) , pulling arm downward, labeled diagram etc. (2.5)	Correct description mentioning 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)	
4	Achievements of genetic engineering in agricultural crops	Correct description mentioning at least five achievements like 1. Increased crop yield 2. Reduced need for pesticides 3. Enhanced quality and nutrient composition 4. Insect resistance 5. Resistance against pathogens 6. Herbicide resistance etc (5)	Correct description mentioning at least four achievements (4)	Correct description mentioning at least three achievements (3)	Correct description mentioning at least two achievements (2)	Correct description mentioning at least one achievement (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)	
OR	Any one group of antibiotics among cephalosporin, sulfonamides and tetracycline	Correct description mentioning any five criteria like, broad or narrow spectrum, bacteriostatic or bactericidal, mechanism of action, uses in diseases, side effects 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)	
	Any other group of antibiotics among cephalosporin, sulfonamides and tetracycline	Correct description mentioning any five criteria like, broad or narrow spectrum, bacteriostatic or bactericidal, mechanism of action, uses in diseases, side effects 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	Causes of air pollution	Correct listing of any five causes of air pollution like, natural events such as forest fires, volcanic eruptions, wind erosion, pollen dispersal, evaporation of organic compounds, natural radioactivity and human causes such as industries and power plants that emit CO ₂ , carbon monoxide, organic compounds, fumes from car exhaust, crop dusting, insecticides and fertilizers etc. (2.5)	Correct listing of any four causes of air pollution (2)	Correct listing of any three causes of air pollution (1.5)	Correct listing of any two causes of air pollution (1)	Some relevant information (0.5)	Wrong answer (0)	
	Control of air pollution	Correct description mentioning any five ways to control air pollution like, use of filter on chimneys to remove SO ₂ , use of alkalis to neutralize acidic wastes, use of ozone friendly products, afforestation, use of lead free fuels in automobiles, use of sulphur free fuels in coal based industries, shifting towards green energy resources to reduce combustion etc. (2.5)	Correct description mentioning any four ways to control air pollution (2)	Correct description mentioning any three ways to control air pollution (1.5)	Correct description mentioning any two ways to control air pollution (1)	Some relevant information (0.5)	Wrong answer (0)	
OR	Haemodialysis	Correct description of haemodialysis mentioning at least five criteria like, insertion of catheter into vein of arm, flow of blood through dialyzer machine, blood pumped and passed through dialysis membrane that separates blood	Correct description of haemodialysis mentioning at least four criteria (2)	Correct description of haemodialysis mentioning at least three criteria (1.5)	Correct description of haemodialysis 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)	
		from dialysis fluid, diffusion of urea and other wastes into the dialysis fluid from blood, cleaner blood of patient passed back into a vein through another catheter, fresh dialysis fluid pumped continuously into dialyzer from one end and used dialysis fluid drained through another end, diagram etc . (2.5)						
	Peritoneal dialysis	Correct description of peritoneal dialysis mentioning at least five criteria like, pumping of dialysis fluid into peritoneal cavity, working of peritoneum as dialysis membrane, injecting of dialysis fluid into abdominal cavity through a tube, leaving the fluid for several hours, exchange of materials between dialysis fluid and tissue fluid, removal of the fluid, done 3-4 times a day, can be performed at home, diagram etc. (2.5)	Correct description of peritoneal dialysis mentioning at least four criteria (2)	Correct description of peritoneal dialysis mentioning at least three criteria (1.5)	Correct description of peritoneal dialysis mentioning at least two criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
6	Role of skeleton in support	Correct description of the role of skeleton in support mentioning at least five criteria like, providing rigid framework for the body, help to maintain the shape of body and organs, left the weight of body against gravitational force, preventing mass of body from collapsing, support to organs for their attachment in the body etc. (2.5)	Correct description of the role of skeleton in support mentioning at least four criteria (2)	Correct description of the role of skeleton in support mentioning at least three criteria (1.5)	Correct description of the role of skeleton in support mentioning at least two criteria (1)	Some relevant information. (0.5)	Wrong answer (0)	
	Role of skeleton in movement	Correct description of the role of skeleton in movement mentioning at least five criteria like, bones working as levers, muscles attached to bones, pulling of muscles produce efficient movements for breathing, chewing, bending and straightening of joints clearly due to attachment of muscles to bones, bones provide strong, suitable	Correct description of the role of skeleton in movement mentioning at least four criteria (2)	Correct description of the role of skeleton in movement mentioning at least three criteria (1.5)	Correct description of the role of skeleton in movement 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)	
		points for firm attachment of muscles etc. (2.5)						
OR	Effects of smoking on circulatory system	Correct description of at least two effects of smoking on circulatory system like, major contributor to coronary heart diseases, nicotine causing the blood to clot easily, hardening the walls of arteries that lead to arteriosclerosis etc. (2)	Correct description of at least one effect of smoking on circulatory system (1)	Some relevant information (0.5)	Wrong answer (0)			
	Effects of smoking on respiratory system	Correct description of at least three effects of smoking on respiratory system like, 70 chemicals in cigarette smoke cause lung cancer, leading cause of emphysema, toxins alters the airways, alveoli, capillaries and immune system of lungs, increase in the chance of pneumonia by four times and tuberculosis of lungs by 2-4 times etc. (3)	Correct description of at least two effects of smoking on respiratory system (2)	Correct description of at least one effect of smoking on respiratory system (1)	Some relevant information (0.5)	Wrong answer (0)		