

RUBRICS: HSSC1ST ANNUAL EXAMINATION 2023
SUBJECT: BIOLOGY-I (HA)

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)		
2(i)	Differences in structure of prokaryotic and eukaryotic cells	Any three correct differences like presence or absence of nucleus, presence or absence of membrane bounded organelles, size of ribosome, composition of cell wall, composition of cell membrane, structure of flagella etc. (3)	Any two correct differences (2)	Any one correct difference (1)	Some relevant information (0.5)	Wrong answer (0)		
2(ii)	Table completion showing protein categories	All six correct filling of blanks i.e., Transport of oxygen= Haemoglobin Enzyme = Catalytic protein/ Name of any enzyme Hormone = Insulin Defensive = antibodies/ immunoglobulins Contractile/ elastic = actin and myosin Storage = ovalbumin/ casein etc. (3)	Any five correct fillings of blanks (2.5)	Any four correct fillings of blanks (2)	Any three correct fillings of blanks (1.5)	Any two correct fillings of blanks (1)	Any one correct filling of blanks (0.5)	Wrong answer (0)
2(iii)	Removal of blood stain by protease washing powder	Correct description mentioning action of protease in washing powder on stains of blood containing hemoglobin/ proteins (1.5)	Some relevant information (1)	Wrong answer (0)				
	Low washing temperature for protease washing powder	Correct description mentioning effect of low/high temperature on protein structural stability/ denaturation present in washing powder. (1.5)	Some relevant information (1)	Wrong answer (0)				
2(iv)	Comparison of action spectrum and absorption spectrum	Any two correct comparisons mentioning definitions of both, highest rate/peaks of absorption versus highest	Any one correct comparison (1.5)	Some relevant information (0.5)	Wrong answer (0)			

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		rate/peaks of photosynthesis at blue and red wavelength, lowest rate/valley of absorption versus lowest rate/valley of photosynthesis at green and yellow wavelengths (3)				
2(v)	Viruses as obligate intracellular parasite	Any two correct reasoning mentioning acellular nature, absence of all required enzymes, absence of ribosomes and other organelles, presence of either RNA or DNA, lack of metabolic machinery etc. (3)	Anyone correct reasoning (1.5)	Some relevant information (1)	Wrong answer (0)	
2(vi)	HIV virus in HIV positive patient without symptoms	Correct description of any two criteria mentioning, replication of HIV in the host cells/helper T-lymphocyte, increase in viral load, acting as provirus etc. OR details of Asymptomatic carrier stage (3)	correct description of anyone criterion OR partial details of Asymptomatic carrier stage (1.5)	Some relevant information (1)	Wrong answer (0)	
2(vii)	Role of contractile vacuole in freshwater protozoans.	Correct description of any two roles mentioning elimination/ removal undigested waste, removal of excretory products/ toxins, Removal of extra water, acting as osmoregulatory structure etc. (3)	Correct description of anyone role (1.5)	Some relevant information (1)	Wrong answer (0)	
2(viii)	Justification of Fungi as separate kingdom.	Correct description of all three criteria i.e., Anyone correct difference from plants like cell wall made up of chitin, heterotrophic mode of nutrition, etc. Anyone correct difference from animals like presence of	Correct description of any two criteria (2)	Correct description of anyone criterion (1)	Some relevant information (0.5)	Wrong answer (0)

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		cell wall, absence of centrioles, non-motile etc. Presence of unique character like nuclear mitosis, decomposer, only absorptive nutrition. (3)				
2(ix)	Reasoning of bryophytes as amphibious plants.	Correct description of any two reasons like dual nature life cycle/ live on land but can't complete life cycle without water), flagellated/motile male gametes, water dependent reproduction, fertilization inside the archegonia, resemblance of reproductive behaviour with amphibian animals etc. (3)	Correct description of anyone reason (1.5)	Some relevant information (1)	Wrong answer (0)	
2(x)	Effect of increased temperature and soil dryness on earthworm	Correct description of earthworm's behavior like, move to deep soil, hibernate/ diapause/ tied up as knot in slimy hole, die (1)	Some relevant information (1)	Wrong answer (0)		
	Increased soil fertility by earthworm	Correct description of burrowing activity of earthworm, mentioning feed on humus, produce nutrient rich feces, make soil soft & airy, help the soil bacteria in decomposition etc. (2)	Partial description with two correct criteria (1)	Some relevant information (0.5)	Wrong answer (0)	
2(xi)	Site of cellular respiration	Mentioning correct name of organelles i.e. Mitochondria (1)	Wrong answer (0)			
	Features of Mitochondria	Any four correct features like Double membrane bounded, self-replicating, outer membrane smooth with porins, inner membrane in-folded to form cristae, presence of F0 & F1 particles/ATP synthase complex,	Any three correct features (1.5)	Any two correct features (1)	Any one correct feature (0.5)	Wrong answer (0)

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		periplasmic space, matrix, power house of cell etc. (2)				
2(xii)	Effect of keeping ripened banana with unripe fruits in paper bag	Correct description of any two criteria including release of ethylene from ripened banana, accumulation of ethylene gas in confined environment of paper bag, stimulation of unripen fruit to ripen by concentrated ethylene gas in bag, paper bag does not trap moisture & ethylene gas in dry environment further speed-up ripening etc. (3)	Correct description mentioning release of ethylene only (1.5)	Some relevant information (0.5)	Wrong answer (0)	
2(xiii)	Differences between Lysosome & Peroxisome	Any two correct differences like contents i.e digestive enzymes vs peroxidases/catalases, functions i.e cellular digestion vs breakdown of toxic peroxides/ photorespiration, occurrence i.e in glandular cells vs liver/plant cells etc (1)	Any one correct difference (0.5)	Wrong answer (0)		
	Differences between Chloroplast & Chromoplast	Any two correct differences like colour i.e green vs other than green, pigments i.e chlorophyll vs others, occurrence i.e leaf mesophyll vs flower petals /fruit, functions i.e photosynthesis vs imparting attraction etc. (1)	Any one correct difference (0.5)	Wrong answer (0)		
	Differences between Microtubules & Microfilaments	Any two correct differences like structure i.e tubular vs filamentous, Chemical composition i.e tubulin vs actin/ myosin,	Any one correct difference (0.5)	Wrong answer (0)		

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		diameter i.e 25nm versus 7 nm, functions i.e cell division vs cellular movements & elasticity present in spindle fibers, centriole, cilia, flagella vs muscle cells etc. (1)						
2(xiv)	Effect of gall bladder removal on fats digestion	Correct description mentioning any three criteria like continuous/unregulated release of bile, no storage of bile, un-concentrated bile salts, insufficient emulsification, no pH maintenance, undigested fats & disturbed bowel movement, insensitivity to CCK etc. (3)	Correct description mentioning any two criteria (2)	Correct description mentioning any one criterion (1)		Some relevant information (0.5)	Wrong answer (0)	
2(xv)	Concept map of digestive system	Correct names of six labelling i.e., 1= Oesophagus 2= Stomach 3= Small intestine 4= Liver 5= Bile 6= Gall bladder (3)	Correct names of five labelling (2.5)	Correct names of four labelling (2)	Correct names of three labelling (1.5)	Correct names of two labelling (1)	Correct names of one labelling (0.5)	Wrong answer (0)
2(xvi)	Effects of Streptococcus infection on heart valves	Correct description mentioning any three effects like inflammation of heart valves, disturbed activity of heart valves, blood leakage/thrombus formation in chambers, hard pumping of blood, fatigued heart muscle, irregular heart beat etc. (3)	Correct description mentioning any three effects (2)	Correct description mentioning any three effects (1)		Some relevant information (0.5)	Wrong answer (0)	
2(xvii)	Labeling of pancreas cell parts	Correct labeling of both i.e 1. Rough endoplasmic reticulum 2. Golgi apparatus/bodies (1)	any one correct labeling (0.5)	Wrong answer (0)				

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	Processes occurring in Endoplasmic reticulum	Any two correct processes like protein synthesis, lipid metabolism, intracellular transport, detoxification etc. (1)	Any one correct process (0.5)	Wrong answer (0)		
	Processes occurring in Golgi apparatus	Any two correct processes like Cell secretions, packaging, conversion into finished products, lysosome formation etc. (1)	Any one correct process (0.5)	Wrong answer (0)		
2(xviii)	Adaptation of memory cells to remain in immune system	Correct description of any three reasons like providing long-lasting protection against the pathogen, quick triggering of immune response on encounter with pathogen, protecting body from re-invasion of pathogen, avoiding reoccurring infections, bypass of initial immune activation steps. (3)	Correct description of any two reasons (2)	Correct description of any one reason (1)	Some relevant information (0.5)	Wrong answer (0)
2(xix)	Structures and processes involved in innate immunity	Correct list of any four structures and processes like Physical barriers including skin, mucus membranes, inflammatory response, fever, phagocytic cells, cytokines, complement system etc. (2)	Correct list of any three structures and processes (1.5)	Correct list of any two structures and processes(1)	Correct name of any one structure and process (0.5)	Wrong answer (0)
	Difference between innate immunity and acquired immunity	Any two correct differences like non-specific vs specific, inherited vs developed in life, parts involved, time of immune development, response time, memory etc. (1)	Any one correct difference (0.5)	Wrong answer (0)		
2(xx)	Occurrence of slime molds	Any one correct habitat of slime mold like damp places, decaying logs, leaf litter etc. (1)	Some relevant information (0.5)	Wrong answer (0)		

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	Salient features of slime molds	Correct list of any four features like Plasmodium body, diploid multinucleate body, phagocytosis of decaying matter, amoeboid movement, sporangia formation under unfavorable conditions, spores formation by meiosis, spores germinate to motile/amoeboid cells, motile cells fuse to form zygote that turn into plasmodium (2)	Correct list of any three features (1.5)	Correct list of any two features (1)	Correct list of any one feature (0.5)	Wrong answer (0)
3(a)	Reasons for DNA strands complementarity	Correct description of any two reasons like base pairing between one purine and other pyrimidine, anti-parallel orientation, safe genetic information in sense and antisense strands, equal distance between the strands, uniform diameter, avoiding mismatched replication errors etc. (2)	Correct description of any one reason (1)	Some relevant information (0.5)	Wrong answer (0)	
	Double helix structure of DNA	Correct description of any three point of Watson & Crick model mentioning sugar-phosphate strands, complementary base pairing, purine-pyrimidine pairing, helical arrangement, ant-parallel strands, major & minor groves, uniform diameter, number of pairs in complete turn etc. (4)	Correct description of any three criteria (3)	Correct description of any two criteria (2)	Some relevant information (1)	Wrong answer (0)
	Diagram of DNA duplex	Correctly sketched & labeled diagram of DNA duplex (1)	Partially sketched & partially labeled diagram (0.5)	Wrong answer (0)		

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3(b)	Lytic cycle of bacteriophage	Correct description mentioning any four criteria like, virulent phages, master-slave relationship, replication, assembly, maturation, number of phage particle produced, lysis etc. (2)	Correct description of any three criteria (1.5)	Correct description of any two criteria (1)	Correct description of any one criteria (0.5)	Wrong answer (0)
	Lysogenic cycle of bacteriophage	Correct description mentioning any four criteria like, temperate phages, host-guest relationship, pro-phage, induction, effect of UV or mutagen exposure etc. (2)	Correct description of any three criteria (1.5)	Correct description of any two criteria (1)	Correct description of any one criteria (0.5)	Wrong answer (0)
	Diagram of Bacteriophage life cycle	Correct and labelled diagram with at least four steps (2)	Partially correct diagram with few labeling (1)	Some relevant information (1)	Wrong answer (0)	
4 (a)	Name of enzyme and site of occurrence of Calvin cycle	Correct names of both enzyme and site i.e RuBisCO and stroma of chloroplast (1)	Correct name of any one (0.5)	Wrong answer (0)		
	Reduction phase of Calvin cycle	Correct description mentioning both steps i.e conversion of 3-PGA to 1,3-BPGA using ATPs and then into G-3-P using NADPH, balanced number of molecules used etc. (2)	Correct description mentioning one steps / conversion of 3-PGA into G-3-P using NADPH and ATP as generalized reaction (1)	Some relevant information (1)	Wrong answer (0)	
	Regeneration of CO ₂ acceptor phase of Calvin cycle	Correct description mentioning entry of G-3-P molecules into a series of reactions, producing RuP and conversion of RuP into RuBP using ATPs, balanced number of molecules used etc. (2)	Correct description mentioning conversion of G-3-P into RuBP using ATPs as generalized reaction (1)	Some relevant information (1)	Wrong answer (0)	

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4 (b)	Sexual reproduction in Zygomycota	Correct description mentioning any four criteria like conjugation, fusion of hyphae of opposite mating types, gametangia formation, septa formation, plasmogamy, karyogammyzygote and zygospore formation, germination of zygospore, formation of spores by meiosis inside sporangium etc. (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Correct description mentioning any one criterion (0.5)	Wrong answer (0)
	Sexual reproduction in Ascomycota	Correct description mentioning any four criteria like plasmogamy, fusion of monokaryotic hyphae of opposite mating types, dikaryotic hyphae, secondary mycelium, ascocarp formation, ascus formation, karyogamy, zygote formation, formation of ascospores by meiosis etc. (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Correct description mentioning any one criterion (0.5)	Wrong answer (0)
	Sexual reproduction in Basidiomycota	Correct description mentioning any four criteria like plasmogamy, fusion of monokaryotic hyphae of opposite mating types, dikaryotic hyphae, secondary mycelium, basidiocarp/ mushroom formation, basidia formation on gills, karyogamy, zygote formation, formation of basidiospores by meiosis etc. (2)	Correct description mentioning any three criteria (1.5)	Correct description mentioning any two criteria (1)	Correct description mentioning any one criterion (0.5)	Wrong answer (0)
	Diagram of the life cycle of flowering plant	Correct diagram with labeling of all parts (at least eight) (2)	Correct diagram with labeling of at least six parts (1.5)	Correct diagram with labeling of at least four parts (1)	Some relevant information (0.5)	Wrong answer (0)

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5 (a)	Conducting system of the heart	Correct description mentioning at least four criteria like SA node, AV node, bundle of His, Purkinje fibres, pacemaker, timing of phases, diagram etc. (4)	Correct description mentioning at least three criteria (3)	Correct description mentioning at least two criteria (2)		Incomplete description mentioning some features (1)	Some relevant information (0.5)	Wrong answer (0)
	Why cardiac muscles are said to be myogenic	Correct description mentioning three criteria like arising of rhythmic contraction from within the muscle, intrinsic rhythmicity, no need of extrinsic stimulation, specialized strands of interconnected tissue, conducting system etc. (3)	Correct description mentioning two criteria (2)	Correct description mentioning one criterion (1)		Some relevant information (0.5)	Wrong answer (0)	
5 (b)	Adaptation of small intestine for absorption of digested products	Correct description mentioning five features like long tube with narrow lumen, muscular walls, peristaltic movements, inner surface has folds, villi in mucosa, presence of microvilli/brush border on epithelium, single cell thick epithelium, rich supply of blood capillaries for absorption of amino acids/ sugars, presence of lacteal for absorption of glycerol/ fatty acids etc. (5)	Correct description mentioning four features (4)	Correct description mentioning three features (3)	Correct description mentioning two features (2)	Description mentioning one feature (1)	Some relevant information (0.5)	Wrong answer (0)
	Diagram of villus	Correct diagram with four labels (1)	Some relevant information (0.5)	Wrong answer (0)				