RUBRICS: HSSC 1ST ANNUAL EXAMINATION 2023
SUBJECT: BIOLOGY-I (Local)

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)
$2(i)$	List of single membrane bounded organelles	Any three correct names like ER, Golgi body, vacuole, lysosome etc. (1.5)	Any two correct names (1)	Any one correct name (0.5)	Wrong answer (0)	
	List of double membrane bounded organelles	Any three correct names like Mitochondria, chloroplast, Nucleus etc. (1.5)	Any two correct names (1)	Any one correct name (0.5)	Wrong answer (0)	
$2(ii)$	Property of water related to cooling of skin	Correct description of any three criteria like specific heat of vaporization of water mentioning 574 cal/gm, more heat required to evaporate less water, cooling effect etc. (1.5)	Partially Correct description (1)	Some relevant information (0.5)	Wrong answer (0)	
	Property of water related to survival of fish in ice covered water	Correct description of any three criteria like lower density of ice than liquid water mentioning, maximum hydrogen bonds, lattice like structure, floating of ice on water, ice act as insulator etc. (1.5)	Partially Correct description (1)	Some relevant information (0.5)	Wrong answer (0)	
$2(iii)$	Graph showing the effect of temperature on rate of reaction	Correct description of three labelling i.e., X= Optimum temperature/ highest rate of reaction/ V_{max} A= Increasing rate of reaction with increasing temperature/ more enzymes activity etc. B= decreasing rate of reaction beyond optimum temperature/ enzyme denaturation etc. (3)	Correct description of two labelling (2)	Correct description of one labelling (1)	Some relevant information (0.5)	Wrong answer (0)
$2(iv)$	Non decomposition of dead bodies by bacteria	Correct description of any three criteria about non-decomposition of dead bodies by bacteria mentioning no recycling, nutrient depletion in soil, Low CO_2 in atmosphere, no photosynthesis, soil infertility, accumulation of dead bodies, continuity of life become endangered etc. (3)	Correct description of any two criteria (2)	Correct description of any one criterion (1)	Some relevant information (0.5)	Wrong answer (0)

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$2(v)$	Effect of green light on plants	Correct description of any two criteria about exposure of only green light on plants mentioning lowest absorption of light, minimum rate of photosynthesis, chlorosis, less food formation, low/stunted growth leads to death etc. (3)	Correct description of any two criteria (2)	Some relevant information (1)	Wrong answer (0)	
$2(vi)$	Effect of penicillin on bacteria cell	Correct description of any one effect of penicillin/antibiotic on bacterial cell mentioning bactericidal, damage cell wall specially gram +ve, inhibition of bacterial growth, effect of antibiotics on bacterial growth etc. (3)	Some relevant information about effect of antibiotic on bacteria (2)	Wrong answer (0)		
$2(vii)$	Concept map of protists characteristics	Correct names of six labelling i.e., 1= protozoan 2= Amoeba 3= ciliate 4= Flagellates 5= Sporozoan 6= Paramecium *(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)
$2(viii)$	Land adaptations in bryophytes	Correct six land adaptations i.e., Multicellular plant body, absorption of carbon dioxide, absorption of water, heterogamy, protection of reproductive cells, embryo formation, alternation of generation etc. (3)	Correct five land adaptations (2.5)	Correct four land adaptations (2) / Correct three land adaptations (1.5)	Correct two land adaptations (1)	Correct one land adaptation (0.5) / Wrong answer (0)
$2(ix)$	Insect larvae as pests	Correct description of any two effects of insect larvae like, Feeding on plant leaves, fruit, roots, seed, stem, stored food Release toxins on the crops/ food etc. (1)	Correct description of anyone effects of insect larvae (0.5)	Wrong answer (0)		
	Benefits of adult insects	Correct description of benefits of any four adult insects like, used as human food, source of	Correct description of benefits of any	Correct description of benefits of any two adult insects (1)	Correct description of benefits of	Wrong answer (0)

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		medicine, components of food chain, honey production, silk production, comb vax production, help in pollination, predators of harmful insects etc. (2)	three adult insects (1.5)			anyone adult insects (0.5)		
$2(x)$	Concept map of mammalian characteristics	Correct names of six labelling i.e., 1= metatheria 2= prototheria 3= eutheria 4= kangaroo 5= duck bill platypus 6= placenta *(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)
$2(xi)$	Difference between collenchyma and sclerenchyma	Any one correct difference like living versus dead cells, presence or absence of secondary cell wall, uniform or uneven thickening of cell wall, role in support etc. (1)	Some relevant information (0.5)	Wrong answer (0)				
	Difference between photoperiodism and phototropism	Any one correct difference like Effect of light period on flowering versus effect of light on plant part movement, reproductive behaviour versus plant movement etc. (1)	Some relevant information (0.5)	Wrong answer (0)				
	Difference between apoplast and symplast pathway	Any one correct difference like pathway formed by interconnecting cell walls versus interconnecting cytoplasm, pathway blocked at endodermis versus continued beyond endodermis etc. (1)	Some relevant information (0.5)	Wrong answer (0)				
$2(xii)$	Seeds as good source of food	Correct description of any three criteria mentioning source of carbohydrates (sugar or starch), source of proteins, source of lipids, source of minerals, source of vitamins, dietary fibers and source of concentrated food or storable food etc. (3)	Correct description of any two criteria (2)	Correct description of any one criterion (1)		Some relevant information (0.5)	Wrong answer (0)	

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$2(xiii)$	Effect of lack of HCl on digestion	Correct description of effects of non-production of HCl in stomach mentioning any two criteria like non activation of pepsinogen into pepsin, no protein digestion, optimum pH for digestion is not maintained, no softening of food, no antiseptic activity, bulky stomach etc. (2)	Correct description of any one criterion (1)	Some relevant information (0.5)	Wrong answer (0)	
	Effect of non-treated HCl deficiency on body	Correct description of any two effects of HCl deficiency on body like protein deficiency, muscle and bone weakening, low growth, enzyme and hormonal deficiency, low immunity, weight loss etc. (1)	Correct description of any one criterion (0.5)	Wrong answer (0)		
$2(xiv)$	Functions of digestive system	Correct description of any three function of digestive system like, ingestion of food, digestion of food, absorption of digested products, egestion of undigested food, vitamin production, killing of germs in food etc. (1.5)	Correct description of any two function of digestive system (1)	Correct description of any one function of digestive system (0.5)	Wrong answer (0)	
	Sequence of food passage through digestive system	Major organs of digestive system from mouth to anus with correct sequence (1.5)	Partially correct or incomplete information (1)	Wrong answer (0)		
$2(xv)$	Effects of chronic diarrhoea	Correct description of any two effects of diarrhoea like dehydration, low blood pressure, muscle weakening electrolyte/mineral/vitamin deficiency, weight loss, temperature imbalance etc. (3)	Correct description of anyone effects of diarrhoea (1.5)	Some relevant information (0.5)	Wrong answer (0)	
2(xvi)	Name of Chemical reaction converting starch/glycogen to glucose	Correct name of reaction i.e., hydrolysis (1)	Wrong answer (0)			
	Steps of chemical reactions converting starch/glycogen to glucose	Correct description of both steps of conversion of: starch to maltose by amylase and from	Correct description of any one step with enzymes/ both steps without	Some relevant information (0.5)	Wrong answer (0)	

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		maltose to glucose by maltase (2)	enzymes/description of hydrolysis (1)					
2(xvii)	Concept map of blood flow through heart	Correct names of six labelling i.e., 1= right atrium 2= right ventricle 3= lungs 4= left atrium 5= left ventricle 6= aorta *(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(xviii)	Immunity in newborn of immune mother to chickenpox exposure	Correct description of capacity of an immune mother to pass the antibodies to her newborn through placenta/ colostrum/ breast feeding OR correct description of passive immunity mentioning chickenpox OR mentioning that there is possibility of chickenpox infection in the newborn. (3)	Some relevant information (1)	Wrong answer (0)				
2(xix)	Arrangement of pigments in photosystems	Correct description of arrangement of accessary pigments (Carotene, xanthophyll and chlorophyll-b) in antenna complex and chlorophyll-a in reaction center/ Labelled diagram of photosystem (1)	Some relevant information (0.5)	Wrong answer (0)				
	Difference between PS-I and PS-II	Any two correct differences between PS-I and PS-II like type of chl-a in reaction center, absorption of maximum wavelength (680nm or 700nm), role in cyclic and noncyclic photophosphorylation, involvement in photolysis of water etc. (2)	Any one correct difference between PS-I and PS-II (1)	Some relevant information (0.5)		Wrong answer (0)		
2(xx)	Difference between viruses and Viroids	Any two correct differences related to structural components, presence or absence of protein and diseases cause by them etc. (2)	Any one correct difference (1)	Some relevant information (0.5)		Wrong answer (0)		

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	Examples of viruses and Viroids	Any one correct example of **both Viroid** (Potato tuber viroid, Tomato macho viroid, Peach mosaic viroid, Hepatitis D viroid etc.) **& Virus** (polio virus, hepatitis virus, smallpox virus etc.) (1)	Any one correct example of virus or viroid (0.5)	Wrong answer (0)		
$3(a)$	What is Plasma membrane?	Correct description of **Plasma membrane** mentioning any four criteria like boundary of protoplasm, found in all cell types, other names of plasma membrane, chemical composition, role of plasma membrane etc. (2)	Correct description of any three criteria (1.5)	Correct description of any two criteria (1)	Some relevant information (0.5)	Wrong answer (0)
	Fluid mosaic model of Plasma membrane	Correct description of **Fluid Mosaic model** mentioning any four criteria like reason of naming, phospholipid bilayer, partiality & wholly embedded proteins, types of different embedded/ cell surface proteins & other molecules, specific roles: fluidity & selective permeability 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 Plasma membrane	Correctly sketched & labelled diagram (1)	Partially sketched & partially labelled diagram (0.5)	Wrong answer (0)		

$3(b)$	Inflammatory response on tissue damage	Correct description mentioning any six criteria like, inflammation, reason for inflammation/ tissue damage/ toxin insertion, major component of non-specific defense/2nd line of defense, signs of inflammation, release of histamine, dilated blood vessels, increased temperature, leakage of interstitial fluid, functions/importance of inflammation, diagram showing inflammatory response etc. (6)	Correct description of any five criteria (5)	Correct description of any four criteria (4)	Correct description of any three criteria (3)	Correct description of any two criteria (2)	Some relevant information (1)	Wrong answer (0)

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4 (a)	i. Types of Sexual reproduction/ Parasexuality in bacteria	Correct description of all three types of sexual reproduction/ Parasexuality i.e. conjugation, transduction & transformation (3)	Correct description of any two criteria (2)	Correct description of anyone criteria (1)	Some relevant information (0.5)	Wrong answer (0)
	ii. Photosynthesis and Respiration as Complementary processes	Mentioning any four correct complementary points like, use vs release of CO_2, use vs release of O_2, use vs release of water, synthesis vs breakdown of glucose/food, anabolism vs catabolism, use vs release of energy etc.) (4)	Mentioning any three correct complementary points (2)	Mentioning any Two correct complementary points (2)	Mentioning any one correct complementary point (1)	Some relevant information (0.5) / Wrong answer (0)
4 (b)	Use of fungi in genetic engineering	Three correct uses of Fungi in genetic engineering like: yeast in molecular genetic study of eukaryotes, yeast as first eukaryotic for genome sequencing, single cell protein synthesis, recombinant yeast for insight studies of genes involved in human genetic diseases, vaccine synthesis, interferon production etc.(3)	Two correct uses of fungi in genetic engineering (2)	one correct use of fungi in genetic engineering (1)	Some relevant information (0.5)	Wrong answer (0)
	Use of fungi in antibiotic production	Three correct uses of Fungi in antibiotic production like penicillin, cyclosporins, Griseofulvin etc. (3)	Two correct uses of Fungi in antibiotic production (2)	one correct use of Fungi in antibiotic production (1)	Some relevant information (0.5)	Wrong answer (0)
5 (a)	ECG stands for	Correct full name/definition of ECG (1)	Wrong answer (0)			
	Phases of ECG	Correct description of three waves/ phases of ECG for polarization/ depolarization of cardiac chambers i.e. P wave /PR interval, QRS wave/QRS interval, T wave/ST interval (3)	Correct description of any two waves/ phases of ECG (2)	Some relevant information (1)	Wrong answer (0)	
	Diagram of ECG	Correctly drawn & fully labelled diagram of ECG (3)	Correctly drawn & partially labelled diagram of ECG (2)	Partially drawn & partially labelled diagram of ECG (1)	Wrong answer (0)	

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5 (b)	Osmotic adjustment in Hydrophytes/Halophytes	Correct description of any two criteria/ **adaptations for osmotic adjustment in Hydrophytes** mentioning like leave size & shape, number & position of stomata, regulation of stomatal opening, presence or absence of cuticle, type of stem, type of root, rate of transpiration etc. **OR Correct description of adaptation of halophytes.** (2)	Correct description of any one criteria/ adaptation for osmotic adjustment in Hydrophytes (1)	Some relevant information (0.5)	Wrong answer (0)	
	Osmotic adjustment in Mesophytes/ Halophytes	Correct description of any two criteria/ **adaptations for osmotic adjustment in Mesophytes** mentioning like leave size & shape, number & position of stomata, regulation of stomatal opening, presence or absence of cuticle, type of stem, type of root, rate of transpiration etc. **OR Correct description of adaptation of halophytes.** (2)	Correct description of any one criteria/ adaptation for osmotic adjustment in Hydrophytes (1)	Some relevant information (0.5)	Wrong answer (0)	
	Osmotic adjustment in xerophytes / Halophytes	Correct description of any two criteria/ **adaptations for osmotic adjustment in Xerophytes** mentioning like leave size & shape, number & position of stomata, regulation of stomatal opening, presence or absence of cuticle, type of stem, type of root, rate of transpiration etc. **OR Correct description of adaptation of halophytes.** (2)	Correct description of any one criteria/ adaptation for osmotic adjustment in Hydrophytes (1)	Some relevant information (0.5)	Wrong answer (0)	

Note: All the markers must know the solutions of all the question items of the question paper before starting marking.