



SECOND YEAR

Kerala Board Answer Key 2023

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ANSWER KEY

Code No SY 526

SECOND YEAR HIGHER SECONDARY EXAMINATION MARCH 2023

PART - III

SUBJECT: BOTANY

30 SCORES

1 HOUR

Qn. No.	Sub Qn.	Answer Key / Value Points		Score	Total Score
		PART I 1 - 5 (Any 3)		3 x 1 = 3	
1		Perisperm		1	1
2		Fragmentation / Decomposition		1	1
3		Gel electrophoresis / Agarose gel electrophoresis / Electrophoresis		1	1
4		Commensalism		1	1
5		cry 1Ab		1	1
		PART II 6 - 16 (Any 9)		9 x 2 = 18	
6		Grazing Food Chain / GFC	Detritus Food Chain / DFC	1 + 1	2
		Begins with Green plants / producers.	Begins with dead organic matter / detritus		
		Major conduit for energy transfer in aquatic ecosystems.	Major conduit for energy transfer in terrestrial ecosystems.		
		(Any one points in each type) or (Flow chart showing GFC and DFC give 1 score each)			
7		♦ Pollen release and stigma receptivity are not synchronized / (Anther & stigma mature at different time). ♦ Anther and stigma are placed at different position. ♦ Self-incompatibility / (genetic mechanism to prevent pollen germination / genetic mechanism to prevent pollen tube formation) ♦ Production of unisexual flowers. ♦ Male and female flowers are present on different plant / (dioecy) (Any 2 points)		1 + 1	2
8		♦ Bacterial cells are treated with specific concentration of divalent cation such as Ca ₂ ⁺ (to increase cell permeability). ♦ Then these cells are treated with recombinant DNA (rDNA) on ice. ♦ The cells and rDNA in ice are allowed to heat at 42°C (heat shock at 42°C). ♦ Put them back on ice (which enables bacteria to take up the Recombinant DNA).		½ x 4	2

9	(a)	Funicle	½	2
	(b)	Micropyle	½	
	(c)	Embryo sac / Female gametophyte	½	
	(d)	Chalaza	½	
10	(a)	Taq polymerase	1	2
	(b)	<i>Thermus aquaticus</i>	1	
11		Rate of biomass / Organic matter production is called productivity.	1	2
		Factors affecting primary productivity	½ x 2	
		The plant species inhabiting a particular area		
		Environmental factors (Sunlight/Temperature/Water /CO2)		
		Availability of nutrients		
		Photosynthetic capacity of plants. (any 2 factors)		
12		The Bt toxin is produced by the bacteria as inactive protoxin.	1+1	2
		When an insect ingest the inactive toxin, it is converted into an active toxin due to the alkaline pH of the gut which solubilise the crystals.		
		The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually leads to death of the insect.		
13	(a)	Mutualism	½	2
	(b)	Parasitism	½	
	(c)	Commensalism	½	
	(d)	Mutualism / Symbiosis	½	
14		When energy flow from a particular trophic level to the next level some energy is lost as heat at each step.	2	2
		Only 10% of the energy is transferred to each trophic level from the lower trophic level. (Any 1 point give full score)		
15		Genetically Modified Organism (GMO) - Organisms whose genes have been altered by manipulation are called Genetically Modified Organisms.	1	2
		◆ Made crops more tolerant to abiotic stresses	1	
		◆ reduce the reliance on chemical pesticides (Pest resistant crops)		
		◆ Helped to reduce post harvest losses		
		◆ Increased efficiency of mineral usage by plants		
		◆ Enhanced nutritional value of food / Golden rice / Vitamin A enriched rice.		
		◆ Used to create tailor made plants to supply alternative resources to industries. (any 1 merit)		

16	(a)	(a) Exponential growth / Geometric growth curve / J shaped curve	½	2
		(b) Logistic growth / Verhulst-Pearl Logistic Growth / Sigmoid Growth curve / S shaped curve	½	
	(b)	K – Carrying capacity	1	
PART III 17 - 20 (Any 3)			3 x 3 = 9	
17		♦ Eli Lilly prepared DNA sequences corresponding to A and B chains of insulin. ♦ Introduced them in plasmid of <i>E.coli</i> to produce insulin chains. ♦ Chain A and B were produced separately. ♦ Chain A and B were extracted and combined by creating disulfide bonds to form human insulin	1 x 3	3
18		♦ Pollen grains are light and non-sticky. ♦ Flowers possess well exposed stamens. ♦ Large feathery stigma ♦ Single ovule in each ovary ♦ Numerous flowers packed into an inflorescence. ♦ Plants produces large amount of pollen ♦ Flowers are colourless ♦ Odourless (Do not have smell) ♦ Nectarless (Any three points)	1 x 3	3
19	(i)	(a) - Mortality / D (b) - Emigration / E	½ ½	3
	(ii)	Natality / B Immigration / I	½ ½	
	(iii)	Natality refers to the number of births during a given period	1	
20		♦ The first letter 'E' comes from the genus / <i>Escherichia</i> ♦ The second two letters come from the species of the prokaryote / bacteria / <i>coli</i> ♦ The letter 'R' is derived from the name of strain / RY 13 ♦ Roman number indicates the order in which the enzyme isolated from that strain of bacteria. (Any 3 points carries 1 score each)	1+1+1	3

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