

**DIRECTORATE OF GOVERNMENT EXAMINATIONS CHENNAI - 6**  
**HSC SECOND YEAR EXAMINATION – MARCH/APRIL- 2023**  
**PART –I BIO-BOTANY - KEY ANSWER**

**NOTE: 1. Answer written only in BLACK or BLUE should be evaluated.**  
**2. Choose the correct answer and write the option code with corresponding answer.**

**Maximum Marks=35**

**Section –1**

**Answer all the questions:**

**8×1=8**

Type A			Type B		
1	b	quick nutrient cycling	1	a	M.S.Swaminathan
2	d	Zingiberaceae	2	c	Green manure
3	a	Loamy soil	3	d	Embryo sac
4	a	Meristem culture	4	d	Zingiberaceae
5	a	M.S.Swaminathan	5	b	quick nutrient cycling
6	c	Green manure	6	d	<i>Agrobacterium tumefaciens</i>
7	d	Embryo sac	7	a	Meristem culture
8	d	<i>Agrobacterium tumefaciens</i>	8	a	Loamy soil

**Section – 2**

**Answer any four questions.**

**4x2 = 8**

9	<b>Stomium :</b> The region along the junction of the two sporangia of an anther lobe which lacks thickening is called Stomium.	2
10	<b>Types of synapsis:</b> i) Procentric synapsis ii) Proterminal synapsis iii) Random synapsis	2
11	<b>Chemicals used in Gene transfer:</b> i) Polyethylene Glycol (or) PEG ii) Dextran Sulphate	1 1
12	<b>PAR :</b> The amount of light available for photosynthesis of plants is called Photosynthetically Active Radiation (PAR) (or) The amount of light available for photosynthesis of plants which is from 400 to 700nm in wave length is called Photosynthetically Active Radiation (PAR) (or) The light rays with the wave length varying from 400 – 700nm are called Photosynthetically Active Radiation.	2

13	<b><u>Primary introduction</u></b> The introduced variety is well adapted to the new environment without any alterations to the original genotype	<b><u>Secondary introduction</u></b> The introduced variety is subjected to selection to isolate superior variety and hybridized with a local variety to transfer one or few characters to them	2
14	<b>Co-evolution:</b> Interaction between organisms, when continues for generations, involves reciprocal changes in genetic and morphological characters of both organisms. This type of evolution is called <b>Co-evolution</b> .		2

### Section – 3

Answer any three questions.

Question number 19 is compulsory

3×3=9

15	<b>Grafting</b> Parts of two different plants are joined to grow as one plant. Plant in contact with soil is called ' <b>stock</b> ' and the plant used for grafting is called ' <b>scion</b> '.  Example : Citrus, Mango, Apple (Any one)	<b>Layering</b> Stem of a parent plant is allowed to develop roots while still intact. When the root develops, the rooted part is cut and planted to grow as a new plant.  Example : <i>Ixora</i> , <i>Jasminum</i> (Any one)	2  1
16	<b>Significance of Ploidy: (any three points)</b> i) More vigorous and more adaptable. ii) Larger flowers and longer flowering duration. iii) Higher fresh weight due to more water content. iv) Useful to determine the phenotypic effects of loss or gain of different chromosomes. v) Play a role in the evolution of plants.		3
17	<b>Plants cultivated in commercial agroforestry:</b> i) <i>Casuarina</i> ii) <i>Eucalyptus</i> iii) Malaivembu iv) Teak v) Kadambu	(Any Four)	3
18	<b>Materials used to grow Spirulina :</b> i) Waste water from potato processing plants (or) Containing starch ii) Straw iii) Molasses iv) Animal manure v) Sewage		(Any Three)  3

19	<p><b>Bio monitoring:</b> The act of observing and assessing the current state and ongoing changes in ecosystem, biodiversity components, landscape including natural habitats, populations and species.</p> <p style="text-align: center;"><b>(or)</b></p> <p>(i) Unmanned aerial vehicle applied to farming. (ii) Agricultural drones let farmers see their fields from sky. (iii) Birds eye view monitoring. (iv) Cost effective safe method.</p> <p style="text-align: right;"><b>(Any Three Points)</b></p>	<b>3</b>
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**Section – 4**

**Answer all questions.**

**2×5=10**

20 (a)	<p><b><u>Characteristic features of Anemophilous flowers:</u></b></p> <p style="text-align: right;"><b><u>(Any Five Points)</u></b></p> <p>i) Pendulous, catkin-like or spike inflorescence. ii) The axis of the inflorescence elongates to bring the flowers above the leaves. iii) Perianth is absent or highly reduced iv) Flowers are small inconspicuous, colourless, not scented, do not secrete nectar v) Stamens – numerous, long filaments, exerted and versatile vi) Anthers produce more pollen grains, minute, light and dry vii) Anthers burst violently to release the pollen grains (e.g.).. <i>Urtica</i> viii) Stigma - large, protruding, branched, feathery, Single ovule is present. ix) Flowers are produced earlier than the new leaves are produced.</p> <p style="text-align: center;"><b>(OR)</b></p>	<b>5</b>
20 (b)	<p><b><u>Incomplete Dominance:</u></b></p> <p><b>Example -4'o clock plant or <i>Mirabilis jalapa</i></b></p> <p><b>Explanation</b></p> <p><b>Checkerboard</b></p> <p><b>Phenotypic ratio (1:2:1) Red-1 Pink-2 White-1</b></p> <p><b>Genotypic ratio (1:2:1) <math>R^1R^1 : R^1R^2 : R^2R^2</math></b></p>	<p><b>1</b></p> <p><b>2</b></p> <p><b>1</b></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>

21 (a)	<b>Anatomical adaptation of Xerophytes :</b> <p style="text-align: right;"><b>(Any Five Points)</b></p> <ul style="list-style-type: none"> <li>i) Presence of multilayered epidermis and thick cuticle to avoid transpiration.</li> <li>ii) Sclerenchymatous hypodermis..</li> <li>iii) Presence of sunken stomata with hairs in the sunken pits in lower epidermis.</li> <li>iv) Scotoactive type of stomata.</li> <li>v) Well developed vascular bundle with several layered bundle sheath.</li> <li>vi) Mesophyll is well differentiated into palisade and spongy parenchyma.</li> <li>vii) In succulents, the stem possesses a water storage region.</li> </ul> <p style="text-align: center;"><b>(OR)</b></p>			<b>5</b>
21 (b)	<b>Plant (1+1)</b>	<b>Active principle (1/2+1/2)</b>	<b>Uses (1+1)</b>	<b>1+1/2+1 =2 1/2</b>
Keezhanelli	Phyllanthin	1.treatment of jaundice (or) Hepatoprotective 2.Effective against Hepatitis B		
Nilavembu	Andrographolides	1.To treat liver disorder (or) Hepatoprotective 2. To treat malaria and dengue		