



ISLAMIAH MAT HR SEC SCHOOL,  
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XII COMMON PUBLIC EXAMINATION, MARCH -2023 (31-03-2023)

TENTATIVE ANSWER KEY  
Question type A

SUB: BIO-BOTANY

MARKS: 35

Q.NO	CONTENT	MARKS	MODE OF QUESTION
<b>PART - I</b>			
I.	CHOOSE THE CORRECT ANSWER	8 X 1 = 8	BOOK BACK / BOOK INSIDE/ CREATIVE
1	b. quick nutrient cycling	1	BOOK BACK
2	d. Zingiberaceae	1	BOOK INSIDE
3	a. Loamy soil	1	BOOK INSIDE
4	a. Meristem culture	1	BOOK BACK
5	a. M.S. Swaminathan	1	BOOK INSIDE
6	c. Green manure	1	BOOK INSIDE
7	d. Embryo sac	1	BOOK BACK
8	d. Agrobacterium tumefaciens	1	BOOK INSIDE

Q.NO	CONTENT	MARKS	MODE OF QUESTION				
II.	<b>PART -II</b> ANSWER ANY FOUR OF THE FOLLOWING	4 X 2 = 8	BOOK BACK / BOOK INSIDE/ CREATIVE				
9	<b>Stomium</b>  The cells along the junction of the two sporangia of anther lobe lack these thickenings. This region is called stomium	2	BOOK INSIDE				
10	<b>Types of Synapsis</b>  1. Procentric synapsis 2. Proterminal synapsis 3. Random synapsis	2	BOOK INSIDE				
11	<b>Chemical used in Gene Transfer</b>  1.Polyethylene Glycol (PEG) 2.Dextran Sulphat.	2	BOOK BACK				
12	<b>PAR</b>  The amount of light available for photosynthesis of plants is called Photosynthetically Active Radiation (PAR)	2	BOOK INSIDE				
13	<b>Primary introduction from Secondary introduction</b> <table border="1" data-bbox="188 981 725 1232"> <thead> <tr> <th>Primary Introduction</th> <th>Secondary Introduction</th> </tr> </thead> <tbody> <tr> <td>Primary introduction - When the introduced variety is well adapted to the new environment without any alternation to the original genotype</td> <td>Primary introduction - When the introduced variety is well adapted to the new environment without any alternation to the original genotype</td> </tr> </tbody> </table>	Primary Introduction	Secondary Introduction	Primary introduction - When the introduced variety is well adapted to the new environment without any alternation to the original genotype	Primary introduction - When the introduced variety is well adapted to the new environment without any alternation to the original genotype	2	BOOK BACK
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14	<b>Co-evolution</b>  The interaction between organisms, when continues for generations, involves reciprocal changes in genetic and morphological characters of both organisms. This type of evolution is called	2	BOOK BACK				

	Coevolution. It is a kind of co-adaptation and mutual change among interactive species.		
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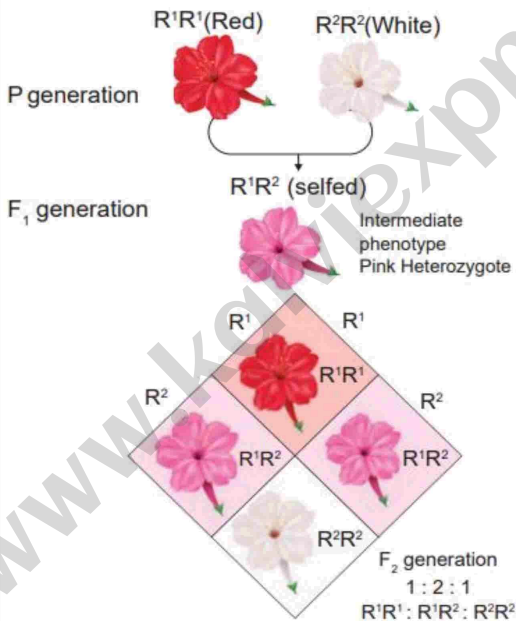
Q.NO	CONTENT	MARKS	MODE OF QUESTION		
III.	<b>PART -III</b> ANSWER ANY THREE OF THE FOLLOWING	3 X 3 = 9	BOOK BACK / BOOK INSIDE/ CREATIVE		
15	<b>Differentiate Grafting and Layering</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Grafting In grafting, two different plants (stock &amp; Scion) are used to develop a new plant. The new plant will support to possess the characters of both the parents or new variation can be noticed.</td> <td style="width: 50%; padding: 5px;">Layering In layering, only one plant is used to develop new plant. Variation cannot be expected. The new individual is exactly similar to a parent plant</td> </tr> </table>	Grafting In grafting, two different plants (stock & Scion) are used to develop a new plant. The new plant will support to possess the characters of both the parents or new variation can be noticed.	Layering In layering, only one plant is used to develop new plant. Variation cannot be expected. The new individual is exactly similar to a parent plant	3	BOOK BACK
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16	<b>Signification of ploidy</b> <ul style="list-style-type: none"> <li>• Many polyploids are more vigorous and more adaptable than diploids.</li> <li>• Many ornamental plants are autotetraploids and have larger flower and longer flowering duration than diploids.</li> <li>• Autopolyploids usually have increase in fresh weight due to more water content.</li> <li>• Aneuploids are useful to determine the phenotypic effects of loss or gain of different chromosomes.</li> <li>• Many angiosperms are allopolyploids and they play a role in an evolution of plants.</li> </ul> <p><b>(ANY THREE POINTS)</b></p>	3	BOOK INSIDE		

17	<p><b>Plant cultivation Commercial agroforestry</b></p> <p>Casuarina Eucalyptus Malai Vembu Teak Kadambu</p> <p><b>(ANY FOUR NAMES)</b></p>	3	BOOK BACK
18	<p><b>Material used to grow micro-organism like Spirulina</b></p> <p>Spirulina can be grown easily on materials like waste water from potato processing plants (containing starch), straw, molasses, animal manure and even sewage.</p>	3	BOOK BACK
19	<p><b>Bio-monitoring</b></p> <p>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>An agricultural drone is an unmanned aerial vehicle applied to farming in order to help increased crop production and monitor crop growth</p>	3	BOOK INSIDE

Q.NO	CONTENT	MARKS	MODE OF QUESTION
	<b>PART –IV</b>		
IV.	ANSWER ALL THE QUESTION	2 X 5 = 10	BOOK BACK / BOOK INSIDE/ CREATIVE
20 (a)	<p><b>Characteristic feature of Anemophilous plants</b></p> <ul style="list-style-type: none"> <li>• The flowers are produced in pendulous, catkin-like or spike inflorescence.</li> <li>• The axis of inflorescence elongates so that the flowers are brought well above the leaves.</li> <li>• The perianth is absent or highly reduced.</li> <li>• The flowers are small, inconspicuous, colourless, not scented, do not secrete nectar.</li> </ul>	5	BOOK INSIDE

	<ul style="list-style-type: none"> <li>• The stamens are numerous, filaments are long, exerted and versatile.</li> <li>• Anthers produce enormous quantities of pollen grains compared to number of ovules available for pollination. They are minute, light and dry so that they can be carried to long distances by wind.</li> <li>• In some plants anthers burst violently and release the pollen into the air. Example: Urtica.</li> <li>• Stigmas are comparatively large, protruding, sometimes branched and feathery, adapted to catch the pollen grains. Generally single ovule is present.</li> <li>• Plant produces flowers before the new leaves appear, so the pollen can be carried without hindrance of leaves.</li> </ul> <p><b>(ANY FIVE POINTS)</b></p>		
20 (b)	<p><b>Incomplete dominance</b></p> <p>No blending of genes The German Botanist Carl Correns's (1905)          Experiment - In 4 O' clock plant, <i>Mirabilis jalapa</i> when the pure breeding homozygous red (R1 R1 ) parent is crossed with homozygous white (R2 R2 ), phenotype of the F1 hybrid is heterozygous pink (R1 R2 ). The F1 heterozygous phenotype differs from both the parental homozygous phenotype. This cross did not exhibit the character of the dominant parent but an intermediate colour pink. When one allele is not completely dominant to another allele it shows incomplete dominance. Such allelic interaction is known as incomplete dominance. F1 generation produces intermediate phenotype pink coloured flower. When pink coloured plants of F1 generation were interbred in F2 both phenotypic and genotypic ratios were found to be identical as 1 : 1(1 red : 2 pink : 1 white). Genotypic ratio is 1 R1 R1 : 2 R1 R2 : 1 R2 R2 .From this we conclude that the alleles themselves remain discrete and unaltered proving the Mendel's Law of Segregation. The phenotypic and genotypic ratios are the same. There is no blending of genes. In the F2 generation R1 and R2 genes segregate and recombine to produce red, pink and white in the ratio of</p>	5	BOOK INSIDE

1 : 2 : 1. R<sup>1</sup> allele codes for an enzyme responsible for the formation of red pigment. R<sup>2</sup> allele codes for defective enzyme. R<sup>1</sup> and R<sup>2</sup> genotypes produce only enough red pigments to make the flower pink. Two R<sup>1</sup> R<sup>1</sup> are needed for producing red flowers. Two R<sup>2</sup> R<sup>2</sup> genes are needed for white flowers. If blending had taken place, the original pure traits would not have appeared and all F<sub>2</sub> plants would have pink flowers. It is very clear that Mendel's particulate inheritance takes place in this cross which is confirmed by the reappearance of original phenotype in F<sub>2</sub>.



21 (a)

**Anatomical adaptations**

- Presence of multilayered epidermis with heavy cuticle to prevent water loss due to transpiration.
- Hypodermis is well developed with sclerenchymatous tissues.
- Sunken shaped stomata are present only in the

5

BOOK INSIDE

	<p>lower epidermis with hairs in the sunken pits.</p> <ul style="list-style-type: none"> <li>• Scotoactive type of stomata found in succulent plants</li> <li>• Vascular bundles are well developed with several layered bundle sheath.</li> <li>• Mesophyll is well differentiated into palisade and spongy parenchyma.</li> <li>• In succulents the stem possesses a water storage region.</li> </ul>		
21 (b)	<p><b>Keezhanelli</b>  <b>Botanical name :</b> Phyllanthus amarus  <b>Active principle:</b> Phyllanthin is the major chemical component.  <b>Medicinal importance</b> Phyllanthus is a well-known hepato-protective plant generally used in Tamil Nadu for the treatment of Jaundice. Research carried out by Dr. S P Thyagarajan and his team from University of Madras has scientifically proved that the extract of P. amarus is effective against hepatitis B virus.</p> <p><b>Adathodai</b>  <b>Botanical name :</b> Justicia adhatoda  <b>Active principle:</b> Vascin  <b>Uses</b> Adhatoda possess broncho dilating property. The decoction is used in treating many bronchial disorders such as cough, cold and asthma. It is also used in treating fevers. The extract forms an ingredient of cough syrups.</p> <p><b>Nilavembu</b>  <b>Botanical name :</b> Andrographis paniculate  <b>Active principle:</b> Andrographolides.  <b>Medicinal importance:</b> Andrographis is a potent hepatoprotective and is widely used to treat liver disorders.</p> <p><b>Turmeric</b>  <b>Botanical name :</b> Curcuma longa  <b>Active principle:</b> Curcumin.  <b>Medicinal importance:</b> Curcumin (the yellow colouring principle is the major pharmacologically active compound of turmeric) is well known for its</p>	5	BOOK BACK

<p>medicinal properties. It is used to treat Alzheimer's disease due to its property to cross over blood brain barrier. It has a very powerful anti-oxidant, anti-cancerous, anti-inflammatory, anti-diabetic, anti-bacterial, anti-fungal and anti viral properties. It is one of the traditional medicines used for wound healing.</p>		
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**(ANY TWO PLANTS)**



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