

**DIRECTORATE OF GOVERNMENT EXAMINATION CHENNAI- 6**  
**HSE SECOND YEAR EXAMINATION – MARCH– 2025**  
**BIO-BOTANY (PART – I) ANSWER KEY**

**Maximum Marks : 35**

**NOTE:**

1. Use blue or black ink to write and underline and pencil to draw the diagram.
2. Choose the correct answer and write the option code answers in section -1

**SECTION –1**

**Answer all the questions :**

**8×1=8**

Q.No	OPTION	TYPE - A	OPTION	TYPE - B
1	a	7	c	Soil
2	d	2 – 10 %	d	Meristem culture
3	c	Seed	d	2 – 10 %
4	d	DNA	a	Appiko movement
5	d	Meristem culture	c	Skin colour in humans
6	a	Appiko movement	c	Seed
7	c	Soil	a	7
8	c	Skin colour in humans	d	DNA

**SECTION – 2**

**Answer any four questions:**

**4×2 = 8**

9	<b>Mellitophily:</b> Pollination by Bees	2
10	<b>Pollenkit:</b> 1. Contributed by the tapetum and coloured yellow or orange and is chiefly made of carotenoids or flavonoids. 2. Oily layer forming a thick viscous coating over pollen surface. 3. Attracts insects and protects damage from UV radiation. (Any Two Points)	2









11	<b>Significance of ploidy:</b> 1. Many polyploids are more vigorous and more adaptable than diploids. 2. Many ornamental plants are autotetraploids and have larger flowers and longer flowering duration than diploids. 3. Autoployploids usually have higher in fresh weight due to more water content. 4. Aneuploids are useful to determine the phenotypic effects of loss or gain of different chromosomes. 5. Many angiosperms are allopolyploids and they play a role in the evolution of plants. <div>(Any Two Points)</div>		2			
12	<b>Examples for micro propagation :</b> 1. Pineapple 2. Banana 3. Strawberry 4. Potato <div>(Any Two Points)</div>		2			
13	<b>Objectives of plant breeding:</b> 1. To increase yield, vigour and fertility of the crop. 2. The increase tolerance to environmental condition, salinity, temperature and drought. 3. To prevent the premature falling of buds, fruits etc. 4. To improve synchronous maturity. 5. To develop resistance to pathogens and pests. 6. To develop photosensitive and thermo-sensitive varieties. <div>(Any two Points)</div>		2			
14	<table><tr><th>Biomedicine</th><th>Botanical medicine</th></tr><tr><td>Medicinally useful molecules obtained from plants and marketed as drugs</td><td>Medicinal plants which are marketed as powders or in other modified forms</td></tr></table>	Biomedicine	Botanical medicine	Medicinally useful molecules obtained from plants and marketed as drugs	Medicinal plants which are marketed as powders or in other modified forms	2
Biomedicine	Botanical medicine					
Medicinally useful molecules obtained from plants and marketed as drugs	Medicinal plants which are marketed as powders or in other modified forms					

### SECTION – 3

Answer any three of the following questions.

Q.No 19 is compulsory .

3 x 3 = 9

15	<b>Types of Aneuploidy:</b> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; text-align: center;"> <div> Disomy (normal) (2n)</div> <div> Monosomy (2n - 1)</div> <div> Double Monosomy (2n - 1 - 1)</div> <div> Nullisomy (2n - 2)</div> <div> Trisomy (2n + 1)</div> <div> Double Trisomy (2n + 1 + 1)</div> <div> Tetrasomy (2n + 2)</div> <div> Pentasomy (2n + 3)</div> </div> <p style="text-align: right;">(Any Three)</p>	3
----	---	---

16	<p><b>Advantages of Artificial Seeds:-</b></p> <ol style="list-style-type: none"> <li>1. Millions of artificial seeds can be produced at any time at low cost.</li> <li>2. They provide an easy method to produce genetically engineered plants with desirable traits.</li> <li>3. It is easy to test the genotype of plants.</li> <li>4. They can potentially stored for long time under cryopreservation method.</li> <li>5. Artificial seeds produce identical plants.</li> <li>6. The period of dormancy of artificial seeds is greatly reduced, hence growth is faster with a shortened life cycle.</li> </ol> <p style="text-align: right;">(Any Three points)</p>	3
17	<p><b>Plants cultivated in commercial Agroforestry:</b></p> <ol style="list-style-type: none"> <li>1. Casuarina</li> <li>2. Eucalyptus</li> <li>3. Malaivembu</li> <li>4. Teak</li> <li>5. Kadambu</li> </ol> <p style="text-align: right;">(Any Three points)</p>	3
18	<p><b>Heterosis:</b></p> <ul style="list-style-type: none"> <li>• The superiority of the F1 hybrid in performance over its parents is called heterosis or hybrid vigour .</li> <li>• G.H.Shull was the first scientist to use the term heterosis in 1912.Vigour refers to increase in growth, yield, greater adaptability of resistance to diseases, pest and drought.</li> </ul>	2 1
19	<p><b>Economic importance of rice :</b></p> <ol style="list-style-type: none"> <li>1. Rice is the easily digestible calorie rich cereal food which is used as a staple food in southern and North East India.</li> <li>2. Various rice products such as Flaked rice are used as breakfast cereal or as snack food.</li> <li>3. Rice bran oil obtained from the rice bran is used in culinary and industrial purpose.</li> <li>4. Husks are used as fuel and in the manufacture of packing material and fertilizer.</li> </ol> <p style="text-align: right;">(Any Three points)</p>	3



## SECTION – 4

Answer all the questions

2 x 5 = 10

20 (a)	<b>Dihybrid Cross :</b> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Explanation or Punnett's square (flow chart)</li> <li>• Ratio</li> </ul>	2 2 1
	(OR)	
20 (b)	<b>Advantages and Disadvantages of Bt cotton:</b> <b>Advantages: (Any Two points)</b> <ol style="list-style-type: none"> <li>1. Yield of cotton is increased due to effective control of bollworms.</li> <li>2. Reduction in insecticide use in the cultivation of Bt cotton.</li> <li>3. Potential reduction in the cost of cultivation.</li> </ol> <b>Disadvantages: (Any Three points)</b> <ol style="list-style-type: none"> <li>1. Cost of Bt cotton seed is high.</li> <li>2. Effectiveness up to 120 days after that efficiency is reduced.</li> <li>3. Ineffective against sucking pests like jassids, aphids and whitefly.</li> <li>4. Affects pollinating insects and thus yield</li> </ol>	2  3
21 (a)	<b>Morphological adaptations of halophytes:</b> <ol style="list-style-type: none"> <li>1. The temperate halophytes are herbaceous but the tropical halophytes are mostly bushy.</li> <li>2. In addition to the normal roots many stilt roots are developed.</li> <li>3. A special type of negatively geotropic roots called pneumatophores with pneumathods to get sufficient aeration are also present. They are called breathing roots. Example. Avicennia</li> <li>4. Presence of thick cuticle on the aerial parts of the plant body.</li> <li>5. Leaves are thick, entire, succulent and glossy. Some species are aphyllous (without leaves).</li> <li>6. Viviparous mode of seed germination is found in halophytes.</li> </ol> <p style="text-align: right;">(Any Five points)</p>	5
	(OR)	
21 (b)	<b>(i) Food Web :</b> Inter-locking pattern of a number of food chains form a web like arrangement <b>(ii) Significance of Food web : (Any Three points)</b> <ol style="list-style-type: none"> <li>1. Food web is constructed to describe species interaction called direct interaction.</li> <li>2. It can be used to illustrate indirect interactions among different species.</li> <li>3. It can be used to study bottom-up or top- down control of community structure.</li> <li>4. It can be used to reveal different patterns of energy transfer in terrestrial and aquatic ecosystems.</li> </ol>	2  3