

DIRECTORATE OF GOVERNMENT EXAMINATION, CHENNAI – 6
HSC FIRST YEAR EXAMINATION – MARCH/APRIL 2023
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

Maximum Marks : 70

Answer all questions.

15 x 1 = 15

PART– A

(A Type)			(B Type)		
Q. No	Option	Answer	Q. No	Option	Answer
1	(a)	Phyllode- Acacia	1	(a)	(1)-(ii), (2)-(iv), (3)-(i), (4)-(iii)
2	(d)	All of the above	2	(d)	Tyloses
3	(a)	Arachis hypogea	3	(b)	Prevent the uptake of Fe, Mg but not Ca (or)
				(c)	Prevent the uptake of Fe, Mg and Ca
4	(b)	Fabaceae	4	(d)	Watson and Crick
5	(b)	P.Mitchell	5	(c)	Synapsis
6	(d)	Watson and Crick	6	(a)	Arachis hypogea
7	(b)	Prevent the uptake of Fe, Mg but not Ca (or)	7	(a)	Phyllode- Acacia
	(c)	Prevent the uptake of Fe, Mg and Ca			
8	(c)	Synapsis	8	(b)	P.Mitchell
9	(d)	2,4 –D and 2,4,5-T	9	(b)	Ernest Ruska
10	(c)	Methanobacterium	10	(a)	Cambium for secondary growth
11	(a)	Cambium for secondary growth	11	(a)	Pinites Succinifera
12	(a)	(1)-(ii), (2)-(iv), (3)-(i), (4)-(iii)	12	(c)	Methanobacterium
13	(b)	Ernest Ruska	13	(d)	All of the above
14	(d)	Tyloses	14	(d)	2,4 –D and 2,4,5-T
15	(a)	Pinites Succinifera	15	(b)	Fabaceae

Part II**Note : Answer any six questions. Question no. 24 is compulsory. 6 x 2 = 12**

16	Bacteria which require CO ₂ for their growth		2
17	Regions of Root: Diagram Any two parts	1 1	2
18	Plectostele : Xylem plates alternates with phloem plates Example : Lycopodium clavatum	1 1	2
19	Significance of Meiosis: 1.It maintains a definite constant number of chromosomes in organisms. 2. Exchange of genetic material leads to variations among species. 3.These variations are the raw materials to evolution. 4.Genetic variability by partitioning different combinations of genes into gametes through independent assortment. 5. Adaption of organisms to various environmental stress. (Any two)	2	2
20	Due to lacking of Protoplast the cells of Sclerenchyma and Tracheids become dead	2	2
21	Pinus wood	Morus wood	
	Common in gymnosperms	Common in angiosperms	
	Non porous because it does not contain vessels.	Porous because it contain vessels.	2
	It is also called soft wood	It is also called Hard wood	2
	(Any two)		
22	In succulent plants, Carbohydrates are partially oxidised to Malic acid without corresponding release of CO ₂ but O ₂ is consumed hence the RQ value will be zero. (or) <i>RQ of glucose in Succulents</i> $\frac{\text{zero molecule of CO}_2}{3 \text{ molecules of O}_2} = 0(\text{zero})$	2 2	2
23	(a) Staminode (b) Epipetalous	1 1	2
24	1. Nitrosomonas 2. Nitrobactor	1 1	2

Part- III**Note: Answer any six questions. Question No.33 is compulsory** 6 x 3 = 18

25	<ol style="list-style-type: none"> 1. Yes 2. The anthredia produces biflagellate anthrozoids which swims in thin film of water and reach the archegonium and fuse with the egg to form diploid zygote. 	1 2	3
26	<p>Physiological effects of Auxin:</p> <ol style="list-style-type: none"> 1. They promote cell elongation in stem and coleoptile 2. At higher concentration auxins inhibit the elongation of roots but extremely lower concentrations promotes growth of root. 3. Suppression of growth in lateral bud by apical bud due to auxin produced by apical bud is termed as apical dominance. 4. Auxin prevents abscission 5. It is used to eradicate weeds. Example 2,4-D and 2,4,5-T. 6. Synthetic auxins are used in the formation of seedless fruits. (parthinocarpic fruit). 7. It is used to break the dormancy in seeds <p style="text-align: right;">(Any three only)</p>	3×1	3
27	<p>In certain plants deficiency symptoms appear first in younger leaves while in others they do so in mature organs, mainly due to mobility of minerals.</p> <p style="text-align: center;">(or)</p> <ol style="list-style-type: none"> 1. Calcium, Sulphur, Iron, Boron and Copper shows deficiency symptoms first that appear on young leaves due to the immobile nature of minerals. 2. Nitrogen, Phosphorus, Potassium and Magnesium deficiency symptoms first appear on old and senescent leaves due to active movement of minerals to younger leaves. 	3 1 ½ 1 ½	3
28	<p>Structure of plant cell:</p> <p style="text-align: right;">Diagram :</p> <p style="text-align: right;">Any 4 parts</p>	2 1	3
29	<p>Class : Dicotyledonae</p> <p>Sub class: Polypetalae</p> <p>Series : Calyciflorae</p>	1 1 1	3

Part-IV**Note: Answer the following questions**

5 x 5 =25

34 a)	Differences between Gram positive and Gram negative bacteria.				5×1	5
	s.No	Characters	Gram positive bacteria	Gram negative bacteria.		
	1	Cell wall	Thick Layered	Thin layered		
	2	Rigidity of the cellwall	Rigid	Elastic		
	3	Chemical composition	Teichoic acid Present	Teichoic acid absent		
	4	Outer membrane	Absent	Present		
	5	Periplasmic space	Absent	Present		
	6	susceptibility to penicillin	highly susceptible	low susceptible		
	7	Nutritional requirement	Relatively complex	Relatively simple		
	8	Flagella	Contain 2 basal body rings	Contain 4 basal rings		
	9	Libid and lipoproteins	Low	High		
10	Lipopolysaccharides	Absent	Present			
(Any Five Only)						
(OR)						
34 b)	<u>Datura metal – Botanical description: -</u>					
	1). (i). Habit (ii). Root (iii). Stem (iv). Leaf	} (any two)			1	
	2.(i). Inflorescence (ii). Flower (iii). Calyx (iv). Corolla (v). Androecium (vi).Gynoecium (vii). Fruit (viii). Seed	} (any four)			2	5
	3. (i). Floral formula (ii). Floral diagram				1 1	

35	<u>Types of Protostele with Explanation</u>																																			
a)	(i). Haplostele	1	5																																	
	(ii). Actinostele	1																																		
	(iii). Plectostele	1																																		
	(iv). Mixed protostele	1																																		
	(v). Diagrams of plectostele (½) and actinostele (½)	1																																		
(OR)																																				
35	Differences between plant cell and animal cell.																																			
b)	<table border="1"> <thead> <tr> <th>s.no</th> <th>Plant cell</th> <th>Animal cell</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>They are larger in size</td> <td>They are smaller in size</td> </tr> <tr> <td>2</td> <td>Plasmodesmata present</td> <td>Absent</td> </tr> <tr> <td>3</td> <td>Chloroplast present</td> <td>Absent</td> </tr> <tr> <td>4</td> <td>Vacuole large and permanent</td> <td>Vacuole small and temporary</td> </tr> <tr> <td>5</td> <td>cell wall present</td> <td>cell wall absent</td> </tr> <tr> <td>6</td> <td>Tonoplast present around vacuole</td> <td>Tonoplast absent</td> </tr> <tr> <td>7</td> <td>Centriole Absent</td> <td>Centrioles present</td> </tr> <tr> <td>8</td> <td>Nucleus present along the Periphery of the cell</td> <td>Nucleus present at the centre of the cell</td> </tr> <tr> <td>9</td> <td>Lysosomes are rare</td> <td>Lysosomes are present</td> </tr> <tr> <td>10</td> <td>storage material is starch</td> <td>storage material is glycogen</td> </tr> </tbody> </table>	s.no	Plant cell	Animal cell	1	They are larger in size	They are smaller in size	2	Plasmodesmata present	Absent	3	Chloroplast present	Absent	4	Vacuole large and permanent	Vacuole small and temporary	5	cell wall present	cell wall absent	6	Tonoplast present around vacuole	Tonoplast absent	7	Centriole Absent	Centrioles present	8	Nucleus present along the Periphery of the cell	Nucleus present at the centre of the cell	9	Lysosomes are rare	Lysosomes are present	10	storage material is starch	storage material is glycogen	5×1	5
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36	<u>Types of Aestivations: -</u>																																			
a)	(i) Valvate	1	5																																	
	(ii) Twisted	1																																		
	(iii) Quincuncial	1																																		
	(iv) Imbricate	1																																		
	(v) Vexillary	1																																		
(Explanation ½, Diagram or example ½ to each type)																																				
(OR)																																				
36	Prophase																																			
b)	Metaphase																																			
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	Telophase	1	5																																	
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37 (a)	Steps involved in Dark reaction .Detail 1.Carboxylation.[fixation] 2.Reduction.[glycolytic reversal] 3.Regeneration phase I-Carboxylation[Fixation]: - Explanation phase II- Reduction (Glycolytic Reversal) - Explanation phase -III- Regeneration: - Explanation (OR) Flow Chart (Mention of enzymes & carbon symbol are not necessary)	1 1 2 1 5	5
(OR)			
37 (b)	<u>Alternative way of Glucose breakdown: -</u> (i) Pentose Phosphate pathway or Phospho gluconate pathway or HMP shunt or Direct Oxidative Pathway or Warburg-Dickens-Lipmann pathway } (any one) (ii) Flow chart - (Mention of stages& carbon symbol are not necessary) (OR) i) Pentose Phosphate pathway or Phospho gluconate pathway or HMP shunt or Direct Oxidative Pathway or Warburg-Dickens-Lipmann pathway } (any one) ii) Explanation	1 4 1 4	5
38 a)	<u>Types of Sclereids</u> (i) Brachysclereids (ii) Macrosclereids (iii) Osteosclereids (iv) Astrosclereids (v) trichosclereids (Explanation – ½, Example or Diagram – ½ for each type)	1 1 1 1 1	5
(OR)			

