

**DIRECTORATE OF GOVERNMENT EXAMINATIONS, CHENNAI-6**  
**HIGHER SECONDARY FIRST YEAR EXAMINATIONS, MARCH – 2024**  
**BOTANY KEY ANSWER**

**Note:**

1. Answer written only in **BLACK** or **BLUE** should be evaluated.
2. Use Pencil to draw diagram
3. Choose the correct answer and write the option code.

**Maximum Marks: 70****PART - I****Answer all questions.****15x1=15**

TYPE – A			TYPE – B		
Q. No		Answer	Q. No		Answer
1	c	Glycocalyx	1	d	Pachytene
2	b	Cuticular	2	a	Acetyl CoA
3	a	202	3	b	Cuticular
4	a	Acetyl CoA	4	d	Chloroplast
5	c	Copper	5	c	Glycocalyx
6	d	Pachytene	6	d	Foliar bud, cauline bud
7	d	C <sub>4</sub> plants	7	a	202
8	d	Chloroplast	8	a	Floridean starch
9	d	Foliar bud, cauline bud	9	c	Copper
10	c	B	10	b	Pea, Barley, Oats
11	b	Mixed inflorescence	11	d	C <sub>4</sub> plants
12	b	Cucurbitaceae	12	c	Duramen
13	b	Pea, Barley, Oats	13	b	Mixed inflorescence
14	a	Floridean starch	14	b	Cucurbitaceae
15	c	Duramen	15	c	B

**PART - II**

**(Answer any Six Questions,  
Question No. 24 is Compulsory)**


**6 X2=12**

Q. NO	Answer	Marks	
16	Suppression of growth in lateral bud by apical bud due to auxin produced by apical bud is termed as apical dominance	2	2
17	<ol style="list-style-type: none"> <li>1. Cleistothecium</li> <li>2. Perithecium</li> <li>3. Apothecium</li> <li>4. Pseudothecium</li> </ol>	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2

Q. NO	Answer	Marks	
18	Spring season Because Cambium is very active and produce a large number of xylary elements having vessels/tracheids with wide lumen. (or) Because of Cambium is more active in spring season.	1 1	2
19	The female sex organ of Chara is called Oogonium or Nucule	2	2
20	A – Molybdenum (or) Mo B – Zinc (or) Zn	1 1	2
21	1. <i>Solanum tuberosum</i> 2. <i>Lycopersicon esculentum</i> 3. <i>Solanum melongena</i> 4. <i>Capsicum annuum</i> 5. <i>Capsicum frutescens</i> 6. <i>Physalis peruviana</i> <b>(Any two)</b>	1+1	2
22	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$ (686 K Cal or 2868 KJ) (OR) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$	2	2
23	1. Solute Concentration or Solute potential 2. Pressure potential (or) $\Psi_s, \Psi_p$	1 1	2
24	Mangrove plants develop special kinds of roots (Negatively geotropic) for respiration by <i>pneumatophores</i> for exchange of gases.	2	2

**PART – III****Answer any Six Questions****Question No. 33 is Compulsory****6X3=18**

Q. NO	Answer	Marks	
25	1. Age of wood can be calculated. 2. The quality of timber can be ascertained. 3. Radio-Carbon dating can be verified. 4. Post climate and archaeological dating can be made. 5. Provides evidence in forensics investigation <b>(Any Three)</b>	3	3

Q. NO	Answer	Marks	
26	<p><b>Root climbers</b> – Plants climbing with the help of adventitious roots arising from nodes.</p> <p><b>Stem climbers</b> – These climbers lack specialised structure for climbing and the stem itself coils around the support.</p>	1 ½	3
27	<p>Diagaram</p> <p>Any four parts</p>	2 1	3
28	<p>The enzyme phosphorylase hydrolyses starch into sugar and high p<sup>H</sup> followed by endosmosis and the opening of stomata during light.</p> <p>(or)</p> 	3	3
29	<ol style="list-style-type: none"> <li>1. Cholera - <i>Vibrio cholerae</i></li> <li>2. Typhoid - <i>Salmonella typhi</i></li> <li>3. Tuberculosis - <i>Mycobacterium tuberculosis</i></li> <li>4. Leprosy - <i>Mycobacterium leprae</i></li> <li>5. Pneumonia - <i>Diplococcus pneumonia</i></li> <li>6. Plague - <i>Yersinia pestis</i></li> <li>7. Diphtheria - <i>Corynebacterium diphtheriae</i></li> <li>8. Tetanus - <i>Clostridium tetani</i></li> <li>9. Food poisoning – <i>Clostridium botulinum</i></li> <li>10. Syphilis - <i>Treponema pallidum</i></li> </ol> <p style="text-align: right;"><b>(Any three)</b></p>	3	3
30	<p>The ratio of volume of carbon dioxide given out and volume of oxygen taken in during respiration is called respiratory quotient.</p> <p>(or)</p> $RQ = \frac{\text{Volume of CO}_2 \text{ liberated}}{\text{Volume of O}_2 \text{ consumed}}$ $RQ \text{ of malic acid} = \frac{4 \text{ molecules of CO}_2}{3 \text{ molecules of O}_2} = 1.33 \text{ (more than unity)}$ <p>(or)</p> <p>RQ of malic acid is 1.33 (more than unity)</p>	2  1	3
31	<p>The secondary xylem, also called wood, It is formed by a relatively complex meristem and vascular cambium.</p>	2 1	3
32	<ol style="list-style-type: none"> <li>1. Carboxylation ( Fixation)</li> <li>2. Reduction (or) Glycolytic Reversal</li> <li>3. Regeneration (or) RuBP Regeneration</li> </ol>	1 1 1	3

33	1. Presence of nucleic acid and protein 2. Capable of mutation 3. Ability to multiply within living cells 4. Able to infect and cause diseases in living beings 5. Show irritability 6. Host – specific  <p style="text-align: right;"><b>(Any three)</b></p>	3	3
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### PART – IV

**(Answer all the Questions)**

**5X5=25**

Q. NO	Answer	Marks	
34 (a)	Physiological effects of Cytokinins 1. Cytokinin promotes cell division in the presence of auxin (IAA) 2. Cytokinin induces cell enlargement associated with IAA and gibberellins 3. Cytokinin can break the dormancy of certain light – sensitive seeds like tobacco and induces seed germination 4. Cytokinin promotes the growth of lateral bud in the presence of apical bud 5. Application of cytokinin delays the process of aging by nutrient mobilization. It is known as Richmond Lang effect. 6. Cytokinin (i) increased rate protein synthesis (ii) induces the formation of inter fascicular cambium (iii) overcomes apical dominance (iv) induces formation of new leaves, chloroplast and lateral shoots. 7. Plants accumulate solutes very actively with the help of cytokinins  <p style="text-align: right;"><b>(Any five)</b></p>	5	5
(OR)			
(b)	1. Diagram of Marchantia Sporophyte 2. Label the parts 3. Explanation of Foot 4. Explanation of Seta 5. Explanation of Capsule	1 1 1 1 1	5

Q. NO	Answer	Marks	
35 (a)	Types of Placentation 1. Marginal placentation 2. Superficial placentation 3. Free central placentation 4. Axile placentation 5. Parietal placentation 6. Basal placentation  Any four types, explanation with example	1       4	5
<b>(OR)</b>			
(b)	Differentiate Mitosis from Meiosis		
	Mitosis	Meiosis	
	1. One division	Two divisions	
	2. Number of chromosome remain the same	Number of chromosomes is halved	
	3. Homologous chromosomes line up separately on the metaphase plate	Homologous chromosomes line up in pairs at the metaphase plate	
	4. Homologous chromosome do not pair up	Homologous chromosome pair up to form bivalent	5
	5. Chiasmata do not form and crossing over never occurs	Chiasmata form and crossing over occurs	
	6. Daughter cells are genetically identical	Daughter cells are genetically different from parent cell	
	7. Two daughter cells are formed	Four daughter cells are formed	
	<b>(Any Five)</b>		5
36 (a)	Structure of DNA 1. Diagram 2. Label the parts -(Any four) 3. Explanation	1 1 3	5
<b>(OR)</b>			
(b)	Schematic representation of Glycolysis Flow Chart (OR) Explanation of ten steps	5	5
37 (a)	T.S. of Dicot leaf Diagram Label any four parts	3 2	5
<b>(OR)</b>			

37 (b)	Difference between C <sub>3</sub> plants and C <sub>4</sub> plants			
	C <sub>3</sub> plants	C <sub>4</sub> plants		
	1. CO <sub>2</sub> fixation takes place in mesophyll cells only	1. CO <sub>2</sub> fixation takes place in mesophyll and bundle sheath		
	2. CO <sub>2</sub> acceptor is RuBP only	2. PEP in mesophyll and RuBP in bundle sheath cells		
	3. First product 3C PGA	3. First product is 4C OAA		
	4. Kranz anatomy is not present	4. Kranz anatomy is present		
	5. Granum is present in mesophyll cells	5. Granum present in mesophyll cells and absent in bundle sheath		
	6. Normal chloroplast	6. Dimorphic chloroplast		
	7. Optimum temperature 20°C to 25°C	7. Optimum temperature 30°C to 45°C		
	8. Fixation of CO <sub>2</sub> at 50 ppm	8. Fixation of CO <sub>2</sub> even less than 10 ppm	5	5
	9. Less efficient due to higher photorespiration	9. More efficient due to less photorespiration		
	10. RuBP carboxylase enzyme used for fixation	10. PEP carboxylase and RuBP carboxylase used		
	11. 18 ATPs used to synthesize one glucose	11. Consumes 30 ATPs to produce one glucose		
12. Example: Paddy, Wheat, Potato and so on.	12. Example: Sugarcane, Maize, Sorghum, Amaranthus and so on.			
<b>(Any five differences only)</b>				
38 (a)	Floral characters of Ricinus communis:			
	Male Flower: Any three characters		1½	
	Female Flower: Any three characters		1½	5
	Floral diagram of male or female flower		1	
	Floral formula		1	
<b>(OR)</b>				
(b)	Types of Tap root modifications.			
	1. Storage roots - Three types		3	
	2. Breathing roots		2	5