

**DIRECTORATE OF GOVERNMENT EXAMINATIONS CHENNAI – 6**

**HIGHER SECONDARY FIRST YEAR EXAMINATION – MAY – 2022**

**KEY ANSWER FOR BOTANY**

**Note:** 1. Answer Written only in BLACK or BLUE should be evaluated

2. Choose the correct answer and written and write the option code with Corresponding answer.

**Maximum Marks – 70**

**PART – I**

Answer **All** questions.

**15×1=15**

Q.No	Option	A Type	Q.No	Option	B Type
1.	d	NAA	1.	a	Acetyl CoA
2.	d	Pollinium	2.	c	rRNA
3.	d	Virus	3.	b	Bacteriophage
4.	b	Bacteriophage	4.	b	Trichomes helps in dispersal of fruits and seeds
5.	a	Calcium	5.	d	Pollinium
6.	a	Acetyl CoA	6.	a	Abscissic acid
7.	a	<i>Psoralea corylifolia</i>	7.	a	Calcium
8.	b	Floridean starch	8.	a	Secondary Xylem
9.	a	Abscissic acid	9.	a	<i>Allium cepa</i>
10.	b	Trichomes helps in dispersal of fruits and seeds	10.	d	Virus
11.	a	<i>Allium cepa</i>	11.	d	NAA
12.	c	rRNA	12.	a	G <sub>1</sub> – S - G <sub>2</sub> - M
13.	a	Secondary Xylem	13.	a	<i>Psoralea corylifolia</i>
14.	a	G <sub>1</sub> – S - G <sub>2</sub> – M	14.	b	Fruit ripening- Carotenoids
15.	b	Fruit ripening- Carotenoids	15.	b	Floridean starch

**PART- II**

Answer any **SIX** Questions. **Question No:24 is compulsory**

6 × 2 = 12

Q.No	EXPLANATION	MARKS
16.	<p>Lichens</p> <p>(i) The symbiotic association between algae and fungi</p> <p>(ii) The algal partner is called phycobiont (or) photobiont and the fungal partner is called Mycobiont</p> <p>(iii) Algae provide nutrition for fungal partner in turn fungi provide protection and also help to fix the thallus to the substratum through rhizinae.</p> <p>(iv) A sexual reproduction takes place through fragmentation, Soredia and Isidia</p> <p>(v) Phycobionts reproduce by akinetes, hormogonia aplanospore etc.</p> <p>(vi) Mycobionts undergo sexual reproduction and produce ascocarps.</p> <p align="center"><b>(Any Two)</b></p>	<b>2×1=2</b>
17.	Bryophytes lack vascular tissue and hence called Non-vascular cryptogams.	<b>2</b>
18.	The mode of arrangement of leaves on the stem is known as phyllotaxy	<b>2</b>
19.	Diagram of Stamen -1 Parts – 1	<b>2</b>
20.	<b>Br., Ebrl., ⊕, ♀, K<sub>(5)</sub>, C<sub>(5)</sub>, A<sub>5</sub>, G<sub>(2)</sub></b>	<b>2</b>
21.	Plasmodesmata act as a channel between the protoplasm of adjacent cells through which many substances pass through.	<b>2</b>
22.	A series of events leading to the formation of new cell is known as cell cycle.	<b>2</b>
23.	<p>Nitrates in the soil are converted back into atmospheric nitrogen by a process called denitrification.</p> <p align="center">(or)</p> <p align="center">Nitrate <math>\xrightarrow{\text{Pseudomonas}}</math> Molecular Nitrogen</p> <p align="center"><math>(\text{NO}_3^-)</math> <span style="margin-left: 150px;"></span> <math>(\text{N}_2)</math></p>	<b>2</b>
24.	Nucleoside	Nucleotide
	It is a combination of base and sugar.	It is a combination of Nucleoside and phosphoric acid
		<b>2</b>

**PART- III**

Answer any Six Questions. Question No: 33 is compulsory

6×3=18

Q.No	EXPLANATION	MARKS				
<b>25.</b>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th align="center" style="width:50%;">Taxonomy</th> <th align="center" style="width:50%;">Systematics</th> </tr> <tr> <td style="vertical-align: top;">                     (i) Discipline of classifying organisms into taxa                      (ii) Governs the practices of naming describing, identifying and specimen preservation.                      (iii) Classification + Nomenclature = Taxonomy.                 </td> <td style="vertical-align: top;">                     (i) Broad field of Biology that studies the diversification of species.                      (ii) Governs the evolutionary history and phylogenetic relationship in addition to taxonomy.                      (iii) Taxonomy + Phylogeny = systematics.                 </td> </tr> </table>	Taxonomy	Systematics	(i) Discipline of classifying organisms into taxa (ii) Governs the practices of naming describing, identifying and specimen preservation. (iii) Classification + Nomenclature = Taxonomy.	(i) Broad field of Biology that studies the diversification of species. (ii) Governs the evolutionary history and phylogenetic relationship in addition to taxonomy. (iii) Taxonomy + Phylogeny = systematics.	<b>3</b>
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<b>26</b>	(i) Stomatal transpiration - 1 (ii) Lenticular transpiration - 1 (iii) Cuticular transpiration - 1	<b>3</b>				
<b>27.</b>	<ul style="list-style-type: none"> <li>• Controlling all cellular activities</li> <li>• Storing the genetic or hereditary information.</li> <li>• Coding the information from DNA for the production of enzymes and proteins.</li> <li>• DNA duplication and transcription takes place in the nucleus.</li> <li>• In Nucleolus ribosomal biogenesis takes place.</li> </ul>	<b>3</b>				
<b>28.</b>	<ul style="list-style-type: none"> <li>• Some cells exit G<sub>1</sub> and enters a quiescent stage called G<sub>0</sub>.</li> <li>• The cell remains metabolically active without proliferation.</li> <li>• Cells can exit for long periods in G<sub>0</sub> phase.</li> <li>• In G<sub>0</sub> cells cease growth with reduced rate of RNA and protein synthesis.</li> <li>• The G<sub>0</sub> phase is not permanent.</li> <li>• Mature neuron and Skeletal muscle remain permanently in G<sub>0</sub></li> <li>• G<sub>0</sub> cells are not dormant.</li> </ul>	<b>3</b>				
<b>29.</b>	Types of meristems based on their position Diagram – 2 Parts – 1	<b>3</b>				
<b>30.</b>	Some of the lateral roots give rise to branches which grow vertically upward below the ground level they branch repeatedly to form dichotomously branched coral-like roots called coralloid roots – 2 Example – Cycas - 1	<b>3</b>				
<b>31.</b>	Br., Ebrl., $\frac{1}{2}$ , K <sub>5</sub> , C <sub>5</sub> , A <sub>5</sub> , G	<b>3</b>				
<b>32.</b>	<ul style="list-style-type: none"> <li>• Helps to derive nutrition in <i>Monotropa</i> a saprophytic angiosperm.</li> <li>• Improves the availability of minerals and water to the plants.</li> <li>• Provides drought resistance to the plants.</li> <li>• Protects roots of higher plants from the attack of plant pathogens.</li> </ul> ( Any Three)	<b>3×1=3</b>				
<b>33.</b>	Krebs cycle is primarily a catabolic pathway, but it provides precursors for various biosynthetic pathways there by an anabolic pathway two. Hence it is called amphibolic pathway.	<b>3</b>				

**PART- IV**

**Answer all questions.**

**5X5=25**

<p><b>34 (a)</b></p>	<p align="center"><b>Sap Wood</b></p> <ul style="list-style-type: none"> <li>• Living part of the wood</li> <li>• It is situated on the outer side of wood</li> <li>• It is pale coloured</li> <li>• Very soft in nature</li> <li>• Tyloses are absent</li> <li>• It is not durable and not resistant to Microorganisms</li> </ul>	<p align="center"><b>Heart wood</b></p> <ul style="list-style-type: none"> <li>• Dead part of the wood</li> <li>• It is situated in the centre part of wood</li> <li>• It is dark coloured</li> <li>• Hard in Nature</li> <li>• Tyloses are present</li> <li>• It is more durable and resists microorganisms.</li> </ul>	<p align="center"><b>5</b></p>												
<p><b>34 (b)</b></p>	<p align="center"><b>OR</b></p> <p>All are globular proteins.          They act as Catalysts and effective even in small quantity.          They remain unchanged at the end of the reaction.          They are highly specific.          They have an active site where the reaction takes place.          Enzymes lower activation energy of the reaction they catalyse.</p>		<p align="center"><b>5</b></p>												
<p><b>35 (a)</b></p>	<p><b>Significance of Pentose Phosphate Pathway:</b></p> <ol style="list-style-type: none"> <li>1. HMP shunt is associated with the generation of two important products, NADPH and Pentose sugars, which play a vital role in Anabolic reactions.</li> <li>2. Coenzyme NADPH generated is used for productive biosynthesis and counter damaging the effects of oxygen free radicals.</li> <li>3. Ribose-5-Phosphate and its derivatives are used in the synthesis of DNA, RNA, ATP, NAD<sup>+</sup>, FAD and Coenzyme A.</li> <li>4. Erythrose is used for synthesis of anthocyanin lignin and other aromatic compounds.</li> </ol> <p align="right">5×1=5</p>		<p align="center"><b>5</b></p>												
<p><b>35 (b)</b></p>	<p><b>Ascent of Sap with Balsam plant:</b>  <b>Explanation – 3</b>  <b>Diagram – 1</b>  <b>Labelling - 1</b>  <b>(OR ) Explanation only - 5</b></p>		<p align="center"><b>5</b></p>												
<p><b>36 (a)</b></p>	<p>Differences between Cyclic Photophosphorylation and Non-Cyclic Photophosphorylation:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; padding: 5px;">Cyclic Photophosphorylation</th> <th style="width: 50%; padding: 5px;">Non-Cyclic Photophosphorylation:</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">1. PS I only involved</td> <td style="padding: 5px;">1. PS I and PS II involved.</td> </tr> <tr> <td style="padding: 5px;">2. Reaction centre is P700.</td> <td style="padding: 5px;">2. Reaction centre is P680</td> </tr> <tr> <td style="padding: 5px;">3. Electrons released are cycled back.</td> <td style="padding: 5px;">3. Electrons released are not cycled back.</td> </tr> <tr> <td style="padding: 5px;">4. Photolysis of water does not take place.</td> <td style="padding: 5px;">4. Photolysis of water takes place.</td> </tr> <tr> <td style="padding: 5px;">5. Only ATP synthesized.</td> <td style="padding: 5px;">5. ATP and NADPH + H<sup>+</sup> are synthesized.</td> </tr> </tbody> </table>		Cyclic Photophosphorylation	Non-Cyclic Photophosphorylation:	1. PS I only involved	1. PS I and PS II involved.	2. Reaction centre is P700.	2. Reaction centre is P680	3. Electrons released are cycled back.	3. Electrons released are not cycled back.	4. Photolysis of water does not take place.	4. Photolysis of water takes place.	5. Only ATP synthesized.	5. ATP and NADPH + H <sup>+</sup> are synthesized.	<p align="center"><b>5</b></p>
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	6. Photophosphorylation: takes place at two places.	6. Photophosphorylation: takes place at only one places.	
	7. It does not require an external electron.	7. Requires external electron donor like H <sub>2</sub> O or H <sub>2</sub> S.	
	8. It is not sensitive to di chloro di methyl urea(DCMI)	8. It is sensitive to DCMI and inhibits electron flow.	
<b>36 (b)</b>	<b>b) Life cycle of Agaricus Diagramatic Representation</b>		<b>5</b>
<b>37 (a)</b>	Structure and function of mRNA - 1 Structure and function of tRNA - 1 Structure and function of rRNA - 1 Diagram – 2		<b>5</b>
<b>37 (b)</b>	Physiological effects of Cytokinin: <ul style="list-style-type: none"> <li>• Cytokinin promotes cell division in the presence of auxin(IAA)</li> <li>• Induces cell enlargement associated with IAA and gibberellins.</li> <li>• Cytokinin can break the dormancy of certain light-sensitive seeds like tobacco and induces seed germination.</li> <li>• Cytokinin promotes the growth of lateral bud in the presence of apical bud.</li> <li>• Application of Cytokinin delays the process of aging by nutrient mobilization. It is known as Richmond Lang effect.</li> <li>• Cytokinin (i) increases 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.</li> <li>• Plants accumulate solutes very actively with the help of cytokinins.</li> </ul>		<b>5</b>
<b>38 (a)</b>	Role of Nitrogenase enzyme in nitrogen fixation. Nitrogenase enzyme role Explanation – 3 Nitrogenase enzyme function diagram – 2		<b>5</b>
<b>38 (b)</b>	Floral characters of <i>Clitoria ternatea</i> : 1. inflorescence 2. flower 3. Calyx 4. Corolla 5. androecium 6. Gynoecium (OR) Floral Diagram - 3 Floral Formula - 2		<b>5</b>