

DIRECTORATE OF GOVERNMENT EXAMINATIONS CHENNAI – 600006
HIGHERSECONDARY FIRST YEAR PUBLIC EXAMINATIONS
MARCH – 2024
BIO-BOTANY – ANSWER KEY

Instructions :

1. Only answers written in Blue Or Black ink should be evaluated
2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer in Part I
3. If any of the answer option code or answer is incorrect then only zero marks shall be awarded.

PART – I**Marks : 35****Answer all the questions.****8 × 1 =8**

Q.No	Option	Type A	Q.No	Option	Type B
1	b)	3 inches	1	c)	Chlorella
2	d)	Multicarpellary, apocarpous ovary	2	d)	Cambium for secondary growth
3	a)	Calcium	3	b)	Cuticular
4	d)	Mitochondria	4	d)	Multicarpellary, apocarpous ovary
5	c)	Chlorella	5	b)	3 inches
6	d)	Cambium for secondary growth	6	d)	PS I and PS II involved in the formation of NADPH + H ⁺
7	b)	Cuticular	7	d)	Mitochondria
8	d)	PS I and PS II involved in the formation of NADPH+ H ⁺	8	a)	Calcium

Section - 2

Answer any Four Questions.

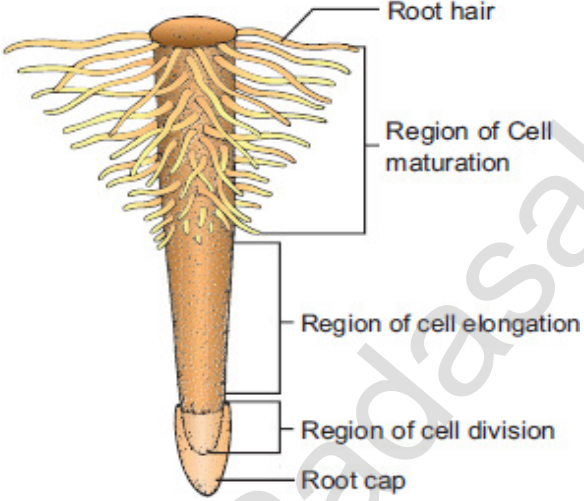
4x2=8

Q.No.	Answer	Marks	Total Marks
9	<p>Dendrochronology :The determination of the age of a tree by counting the annual rings</p> <p>Dendroclimatology : It is the branch of dendrochronology concerned with constructing records of the past climate and climatic events by analysis of growth rings of a tree</p>	1 1	2
10	<p>Non Living characters of virus</p> <ol style="list-style-type: none"> 1.Can be crystallized 2.Absence of metabolism 3.Inactive outside the host 4.Do not show functional autonomy 5.Energy producing enzyme system is absent <p>(Any Two)</p>	1+1	2
11	<p>Synapsis : Pairing of homologous chromosomes taking place in Zygotene stage in Meiosis cell division is known as synapsis</p>		2
12	<p>In succulent plants, during respiration, O₂ is consumed but CO₂ is not released. Hence Respiratory Quotient is zero</p> <p>(OR)</p> <p>RQ of glucose in succulents = $\frac{\text{zero molecule of CO}_2}{\text{3 molecules of O}_2} = 0$</p>		2
13	<p>(a) A sterile stamen - Staminode</p> <p>(b) Stamens are united in one bundle - monadelphous</p>	1 1	2
14	<p>The factors determining water potential are</p> <ol style="list-style-type: none"> 1) Solute concentration or Solute potential (Ψ_s) 2) Pressure potential (Ψ_p) <p>(Or)</p> <p>$\Psi_w = \Psi_s + \Psi_p$</p>	1+1 (Or) 2	2

Section – 3

Answer any three Questions.
Question No.19 is compulsory.

3x3=9

Q.No.	Answer	Marks	Total Marks										
15	<p>Hydroponics or soilless culture</p> <ul style="list-style-type: none"> * The method of growing plants in nutrient solution. * Roots are immersed in the solution containing nutrients. * Air is supplied with help of a tube. <p>(OR)</p> <p>Labelled diagram (Diagram - 2 marks, Parts – 1 mark)</p>	1 1 1	3										
16	<p>Parts of regions of root :</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Diagram</p> <p>Any 2 Parts</p> </div> </div>	2 1	3										
17	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Haplontic Life cycle</th> <th style="width: 50%;">Diplontic Life cycle</th> </tr> </thead> <tbody> <tr> <td>Gametophytic phase (n) is dominant</td> <td>Sporophytic phase (2n) is dominant</td> </tr> <tr> <td>sporophytic phase is represented by zygote</td> <td>Gametophytic phase is represented by single to a few celled gametophyte</td> </tr> <tr> <td>Zygote undergoes meiosis to restore haploid condition</td> <td>Gametes fuse to form zygote which develops into sporophyte</td> </tr> <tr> <td>Ex. Volvox, Spirogyra</td> <td>Ex. Fucus, Gymnosperms, Angiosperms</td> </tr> </tbody> </table>	Haplontic Life cycle	Diplontic Life cycle	Gametophytic phase (n) is dominant	Sporophytic phase (2n) is dominant	sporophytic phase is represented by zygote	Gametophytic phase is represented by single to a few celled gametophyte	Zygote undergoes meiosis to restore haploid condition	Gametes fuse to form zygote which develops into sporophyte	Ex. Volvox, Spirogyra	Ex. Fucus, Gymnosperms, Angiosperms	3×1 (Any Three)	3
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18	Properties of Water : <ul style="list-style-type: none"> • Adhesion and cohesion property. • High latent heat of vaporisation • High melting and boiling point • Universal solvent • Specific heat capacity <p style="text-align: right;">(Any Three)</p>	3×1	3
19	Functions of the Nucleus : <ul style="list-style-type: none"> • Controlling all cellular activities. • coding the information from DNA for the production of enzymes and protein. • Storing the hereditary information. • DNA duplication and transcription takes place in the nucleus. • In nucleolus ribosomal biogenesis takes place <p style="text-align: right;">(Any Three)</p>	3×1	3

Section – 4

Answer all Questions.

2x5=10

Q.No.	Answer	Marks	Total Marks
20 (a)	<i>Allium cepa</i> Habit Root Stem Leaf Inflorescence Flower Perianth Androecium Gynoecium Fruit Seed Floral Diagram Floral Formula <p style="text-align: center;">(Any Three)</p>	3 1 1	5
(OR)			

(b)	<p>Characteristic features of DNA</p> <ul style="list-style-type: none"> • If one strand run in the 5' - 3' direction, the other runs in 3' - 5' direction. • Two strands are antiparallel • The 5' end has the phosphate group and 3' end has the OH group • Diameter of 20 A⁰ and a pitch of 34 A⁰ • Presence of minor groove and major groove • A complete turn of the helix comprises 3.4 nm or 10 base pairs per turn in the B form of DNA. • Hydrogen bond between complementary bases • The Phosphodiester linkage gives strength and stability to the polynucleotide chain • Plectonemic coil and Paranemic coiling are found. • Based on the helix and the distance between the turns, DNA is of three forms - A DNA, B DNA and Z DNA <p style="text-align: right;">(Any Five)</p>	5 x 1	5
21 (a)	<p>Kreb's Cycle flow chart</p> <p style="text-align: center;">(Or)</p> <p>Explanation with</p> <ul style="list-style-type: none"> • Substrates • Enzymes • ATP, NADH₂, FADH₂ 	5 2 2 1	5
(OR)			
(b)	<p>General account on Lichens :</p> <ul style="list-style-type: none"> • Symbiotic association between algae and fungi • Algal partner - phycobiont or Photobiont and Fungal partner - Mycobiont • Algae provide nutrition, Fungi provide protection and help thallus fixing to the substratum • Asexual reproduction by fragmentation, soredia and Isidia • Algae reproduce by akinetes, hormogonia, aplanospore • Mycobionts undergo sexual reproduction by ascocarp <p style="text-align: right;">(Any Five)</p>	5x1	5