

MODEL EXAM - 2022

BOTANY

ANSWER KEY

HSE I

Total score -30

Category	Question No:	Answer key / Value points	Split score	Total score
I		Answer any 3 questions from 1 - 4. Each carries 1 mark		
	1.	Floridean starch	1	1
	2	a) Guttation	1	1
	3	Kranz anatomy	1	1
	4	Glycolysis/ EMP pathway	1	1
II		Answer any 9 questions from 5 – 17. Each carries 2 marks		
	5	<ul style="list-style-type: none">Impermeable seed coatHard seed coatPresence of chemical inhibitors such as abscisic acid, phenolic acid & para-ascorbic acidImmature embryos (any 2 factor)	1+1`	2
	6	Light, CO ₂ , Water, Temperature	½ *4	2
	7	Cell growth , Cell repair , Maintenance of nucleo- cytoplasmic ratio, Regeneration	½ * 4	2
	8	Membraneous extensions of plasma membrane (Infoldings of cell membrane). They are in the form of Vesicles, tubules & lamellae. Functions of mesosome :- Respiration , Secretion, Cell wall formation, DNA replication & distribution to daughter cells, To increase the surface area of the plasma membrane(any 2 functions)	1 1	2
	9	a) Citric acid b) α - Ketoglutaric acid	½ * 4	2

		c) Succinic acid d) Oxalo Acetic acid /OAA		
10		Sieve tube elements , Companion cells, Phloem parenchyma, Phloem fibre	$\frac{1}{2} * 4$	2
11		a) Mitotic phase (M phase) & Interphase b) (a) –G1 phase / post mitotic gap phase, (b) – G2 phase/ Pre mitotic gap phase	1 1	2
12		<ul style="list-style-type: none"> Rough endoplasmic reticulum (RER) :-Endoplasmic reticulum bearing ribosomes on their surface. Function – Protein synthesis & Secretion Smooth endoplasmic reticulum (SER) :-Endoplasmic reticulum without ribosomes. Function :- Synthesis of lipid (In animal cells, steroidal hormones are synthesized in SER) 	1 1	2
13		Bulliform cells –Large, empty, colourless cells occur in the upper epidermis of many grasses. When they absorb water & are turgid, leaf surface is exposed. When they are flaccid due to water stress, they make the leaves curl inwards to minimize water loss.	1 1	2
14		a) Region of maturation b) Region of elongation c) Meristematic region Function of root hair :- Absorption of water & minerals	$\frac{1}{2} * 4$	2
15		Volvox – Algae Pinus - Gymnosperm Salvinia - Pteridophyte Marchantia – Bryophyte	$\frac{1}{2} * 4$	2
16		Diatomaceous earth :- Accumulation of cell wall deposits of diatoms , over billions of years, on their habitat. Use :- Being gritty, soil is used in polishing, filtration of soil & syrups.	1+1	2
17		(1) Antiport (2) Symport	1+1	2

III		Answer any 3 questions from 18 – 22. Each carries 3 marks		
	18	Phyllotaxy :- Arrangement of leaf on stem or branch Types of phyllotaxy :- <ul style="list-style-type: none"> • Alternate :- Single leaf from each node in alternate manner. • Opposite :- Two leaves from each node & lie opposite to each other. • Whorled :- More than two leaves from one node & form a whorl. (explanation of any 2 type) 	1 1+1	3
	19	<ul style="list-style-type: none"> • <i>Rhizobium</i> bacteria multiply and colonise the surroundings of roots and get attached to the epidermal & root hair cells. • Root hair curl & the bacteria invade the root hair. • Infection thread carries bacteria to the inner cortex • Bacteria get modified into rod shaped bacteroids and cause inner cortical & pericycle cells to divide. • Division & growth of cortical and pericycle cells lead to nodule formation. • Mature nodule establishes direct vascular connection with the host for exchange of nutrients. 	$\frac{1}{2} * 6$	3
	20	Aerobic respiration :- Complete oxidation of glucose , Presence of Oxygen , Produce 38 ATP , Oxidation is very vigorous Fermentation :- Incomplete oxidation of glucose , Absence of Oxygen, Produce 2 ATP, Oxidation is slow process (any 3 differences)	$\frac{1}{2} * 3$ $\frac{1}{2} * 3$	3
	21	Auxin :- Apical dominance, Rooting of stem cutting Giberellin :- Bolting, Increase the length of the stem Cytokinin :- Delay leaf senescence, Overcome apical dominance	$\frac{1}{2} * 2$ $\frac{1}{2} * 2$ $\frac{1}{2} * 2$	3

22	a) Chlorophyll a b) Chlorophyll b, Xanthophyll, Carotenoids (any 1) c) They absorb light and transfer the energy to chlorophyll a, Protect chlorophyll a from photo-oxidation (any 1)	1+1+1	3
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