HSS 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.	Osmosis	1	1
	2	Mannitol	1	1
	3	Stroma	1	1
	4	Glycolysis/ EMP pathway	1	1
II		Answer any 9 questions from 5 – 17. Each carries 2 marks		
	5	a) PEP (Phospho enol Pyruvic acid) b) OAA (Oxalo Acetic acid	1+1`	2
	6	Symbiotic association between fungi & roots of higher plants like pinus. • Hyphae have large surface area, so they absorb water and minerals from a larger volume of soil that a root cannot do. • Fungus give water & minerals to roots. Roots give sugar & N- containing compounds to fungus. • Pinus have an obligate association with mycorrhiza. So Pinus seeds cannot germinate without the presence of mycorrhizal association. (any one)	1 1	2
	7	Long day plant (LDP) :- flower when they are exposed to photoperiod longer than critical photoperiod (require more than 12 hours of light).	1	2

		Short day plants (SDP) :- flower only when day length is less than critical period (require less than 12 hours of light). They requires a long period of darkness. eg., Chrysanthemum, soyabean, sugarcane etc.	1	
	8	Bryophytes – Protonema Pteridophytes – Prothallus Gymnosperms – Naked seeded Angiosperms – Double fertilization	½ * 4	2
	9	Xylem vessels, Xylem tracheids, Xylem parenchyma & Xylem fibres	½ * 4	2
	10	Zygotene – Formation of synapsis Pachytene – Crossing over Diplotene – Dissolution of synaptonemal complex Diakinesis – Terminalisation of chiasmata	½ *4	2
	11	Making curd from milk, production of antibiotics, recycling of minerals, Nitrogen fixation (Nostoc, Anabaena), Biogas formation (Methanogens) (Any 2 uses)	1 1	2
	12	Respiratory quotient :- Ratio of volume of CO_2 evolved to the volume of O_2 consumed in respiration RQ of carbohydrate = 1	1 1	2
	13	Prophase, Metaphase, Anaphase, Telophase	½ * 4	2
	14	(A) Matrix . (B) Crista Sites of Aerobic Respiration /Produce cellular energy in the form of ATP.	½ * 2 1	2
	15	Conjoint vascular bundle :- Xylem & Phloem are in the same bundle on the same radius. Phloem located on the outer side of Xylem (explanation or diagram) Radial vascular bundle :- Xylem & Phloem occur in separate bundles on different radius. (Explanation or diagram)	1 1	2
	16	Peduncle (main axis) continues to grow (unlimited growth). Flowers	1+1	2

		borne laterally in an Acropetal succession. eg.,Crotalaria		
	17	• Give shape to the cell • Protects the cell from mechanical damage & infection. • Helps in cell-to-cell interaction & provides barrier to undesirable macromolecules (any two)	1+1	2
III		Answer any 3 questions from 18 – 22. Each carries 3 marks		
	18	Auxin :- Initiate rooting in stem cuttings, Apical dominance, Parthenocarpy in tomatoes Gibberellin :- Bolting in rosette plants, Increase length of grape stalks, Speed up malting process in brewing industry	½ * 3 ½ * 3	3
	19	Cycic photophosphorylation :- Only PS I is functional, Electrons from PS I are cycled back, ATP is synthesized, Photolysis of water absent, Location- Stroma lamella, Found in bacterial cell (any 3 points) Non-cyclic photophosphorylation :- Ps I and PS II are functional, Electrons are not cycled back, ATP & NADPH are synthesized, Photolysis of water present, Location -Thylakoid membrane, Found in green plants (any 3 points) (schematic representation of cyclic & noncyclic photophosphorylation – give full score)	½ * 3 ½ * 3	3
	20	• Hydroponics :- Soilless culture of plants in nutrient medium • Applications :- 1)Essential elements are identified & their deficiency symptoms were discovered. (2) Commercial production of vegetables such as tomato, seedless cucumber & lettuce.	1 1+1	3
	21	• Modification for **Storage** -eg., Carrot, Beetroot, Radish, Sweet potato , Mango ginger , Asparagus etc. • Modification for **Climbing** - eg., betle, pepper, etc • Modification for **Support** – (1) **Prop root** (Pillar like roots from branches) eg., Banyan tree. (2) **Stilt root** (Roots from lower nodes) eg., Maize & Sugarcane.	½ *6	3

		• Modification for **Respiration** - **Pneumatophores** (Roots grow vertically upwards to get Oxygen). eg., Rhizophora (growing in marshy areas) (Any 3 modification with 1 example each)		
	22	a) (A) Citric acid . (B) Succinic acid b) Hans Krebs c) Mitochondria / Matrix	1+1+1	3