

## First Terminal Examination – 2023

### Botany - Answer Key

HSE II

Total marks – 30

Category	Question No:	Answer key / Value points	Split score	Total score
Part I		Answer any 3 questions from 1 - 5 Each carries 1 mark		
	1.	a. Pericarp b. Formation of seed without fertilization	$\frac{1}{2} \times 2$	1
	2	DNA ligase	1	1
	3	a) Sporopollenin	1	1
	4	Agrobacterium tumefaciens	1	1
	5	Stanly Cohen and Herbert Boyer	$\frac{1}{2} \times 2$	1
Part II		Answer any 9 questions from 6 - 16. Each carries 2 mark		
	6	a. Removal of anther from the flower buds of female flower before maturity b. prevent self pollination	1+1	2
	7	a. A vector must contain Origin of replication , Single recognition sequence / cloning site and Selectable marker b. codes for the proteins involved in the replication of plasmids	1+1	2
	8	a. Eggcell & 2 synergids b. Polar nuclei / Secondary nucleus	1+1	2
	9	E - First letter of genus from which it is isolated Co - first two letters of species name of the prokaryotic cell from which they were isolated R - denotes the strain I - romen number , denotes the order in which they are isolated from that strain of bacteria.	$\frac{1}{2} \times 4$	2
	10	Cleistogamous flowers are closed flowers, anthers & stigma lie close to each other. When anther dehisce in the flower buds, pollen grains fall on the stigma and fertilization is effected .	2	2
	11	Microinjection - Recombinant DNA is directly injected into the	1+1	2

		nucleus of an animal cell using micropipette. Biolistics / Gene gun - High velocity microparticles of gold or tungsten coated with DNA and is bombarded into the host cell (plant cell)		
	12	Proembryo – Globular embryo – Heart shaped embryo – Mature embryo	$\frac{1}{2} \times 4$	2
	13	a. Palindromic sequence b. sequence of base pairs that read the same on the two strands when orientation of reading is kept the same	1+1	2
	14	a. In ground nut, endosperm is not present in the seed (Ex- albuminous seed) . In castor, some amount of endosperm left in the seeds (Albuminous seed) b. Self incompatibility is the genetic mechanism to prevent pollen germination / pollen tube formation.	1+1	2
	15	Epidermis, Endothecium & Middle layers Function :- Protection & dehiscence	$\frac{1}{2} \times 4$	2
	16	a. Negatively charged DNA molecules are forced to move towards anode under an electric field through agarose medium b. Separated DNA fragments can be visualised after staining with Ethidium bomide followed by exposure to UV light. bright orange coloured bands obtained.	1+1	2
Part .III		Answer any 3 questions from 17- 20. Each carries 3 marks		
	17	a. Large flowers / colourful flowers / Produce nector / Produce fragrance. ( pleasant or foul) / Sticky and spiny pollen grains / Sticky stigma. b. Rose, Sunflower, Jasmine, Orchids , Rafflesia, Aristolochia etc (any 2)	$\frac{1}{2} \times 4$ $\frac{1}{2} \times 2$	3
	18	a. Selectable markers are used to identify recombinants / transformants from non-recombinants/non-transformants b. Inactivation of an enzyme due to inactivation of a gene as a result of insertion of foreign DNA c. A recombinant DNA is inserted within the coding sequence of an enzyme $\beta$ galactosidase. So the enzyme is inactivated. Recombinants do not produce colour, but Non - recombinants gives bluish coloured colonies	1+1+1	3
	19	a. Syngamy & Triple fusion b. (A) – female gamete / egg cell. (B) – Embryo (C) – Polar nuclei / Secondary nucleus. (D) - Endosperm	$\frac{1}{2} \times 2$ $\frac{1}{2} \times 4$	3

	20	<p>a. DNA enters the bacterium through the pores in cell wall. The bacterial cell is treated with divalent cation such as calcium. Incubate Recombinant DNA and bacterial cell on ice. Place this bacterial cell at 42° C which provides a heat shock &amp; then Put them back on ice. Now bacteria can take up the Recombinant DNA</p> <p>b. To take up hydrophylic DNA molecule from external medium.</p>	2+1	3
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