

SECOND YEAR HIGHER SECONDARY SECOND TERM EXAMINATION , DECEMBER 2024

Part – III

BIOLOGY

PART – A BOTANY

KEY

Maximum score: 30

Q.No		Split score	Total score
1	(b) 8 nuclei and 7 cells	1	1
2	Ethidium bromide	1	1
3	Totipotency	1	1
4	(d) Funicle	1	1
5	Intrinsic rate of natural increase/ (b–d)	1	1
6	Cleistogamous flowers which do not open at all .In such flowers, the anthers and stigma lie close to each other./When anthers dehisce in the flower buds, pollen grains come in contact with the stigma to effect pollination.	1 1	2
7	(a) Somatic hybrid of potato and tomato/ Hybrid plant by fusing the protoplast of potato and tomato. (b) Somatic hybridization/ Tissue culture	1 1	2
8	(a) Sigmoid curve. (b) Lag phase, Phase of acceleration and deceleration, Asymptote.	½ 1½	2
9	(a) As genetically engineered lymphocyte cells are not immortal, the patient requires periodic infusion of such genetically engineered lymphocytes. (b) If the gene isolate from marrow cells producing ADA is introduced into cells at early embryonic stages, it could be a permanent cure.	1 1	2
10	One petal of Ophrys flower bears an uncanny resemblance to the female of the bee in size, colour and markings. The male bee is attracted to what it perceives as a female, 'pseudocopulates' with the flower, and during that process is dusted with pollen from the flower.	1 1	2
11	A-Scutellum B-Shoot apex C-Radicle D-Coleorhiza	4x ½	2
12	In micro-injection, recombinant DNA is directly injected into the nucleus of an animal cell. In biolistics or gene gun method, suitable for plants, cells are bombarded with high velocity micro-particles of gold or tungsten coated with DNA .	1 1	2
13	In Brood parasitism the parasitic bird lays its eggs in the nest of its host and lets the host incubate them. During the course of evolution, the eggs of the parasitic bird have evolved to resemble the host's egg in size and colour to reduce the chances of the hostbird detecting the foreign eggs and ejecting them from the nest. E .g . cuckoo (koel) and the crow.	1 1	2

14	(a) Exonuclease - (iii) (b) Endonuclease- (iv) (c) DNA ligase- (ii) (d) Taq polymerase - (I)	4 x ½	2
15	1. α-1-antitrypsin -used to treat emphysema. 2. Human alpha-lactalbumin - nutritionally a more balanced product for human babies than natural cow-milk	1 1	2
16	The tumor inducing (Ti) plasmid of Agrobacterium tumifaciens has been modified into a cloning vector which is no more pathogenic to the plants but is still able to use the mechanisms to deliver genes of our interest into plants. Retroviruses have also been disarmed and used to deliver desirable genes into animal cells.	1 1	2
17	Very low concentration of a bacteria or virus can be detected by amplification of their nucleic acid by PCR./ PCR is now routinely used to detect HIV in suspected AIDS patients./To detect mutations in genes in suspected cancer patients too./ amA powerful technique to identify many other genetic disorders. (Any 3)	1 1 1	3
18	(a) Pre reproductive, Reproductive, Post reproductive (b) Expanding, Stable, Declining.	1½ 1½	3
19	Selection of parents. Emasculation. Bagging. Collection of pollen from male parent. Dusting the pollen grain on stigma. Re-bagging.	6x ½	3
20	Since the DNA is enclosed within the membranes, we have to break the cell open to release DNA .This can be achieved by treating the bacterial cells/plant or animal tissue with enzymes such as lysozyme (bacteria), cellulase (plant cells), chitinase (fungus). RNA can be removed by ribonuclease, proteins can be removed by treatment with protease. Purified DNA ultimately precipitates out after the addition of chilled ethanol. This can be seen as collection of fine threads in the suspension	6x ½	3