DIRECTORATE OF GOVERNMENT EXAMINATIONS CHENNAI – 6
HIGHER SECONDARY SECOND YEAR EXAMINATION – MAY – 2022
KEY ANSWER FOR BOTANY

Note : 1. Answer written only in BLACK or BLUE should be evaluated.
2. Choose the correct answer and write the option code with corresponding Answer

Maximum marks – 70

PART – I

Answer all questions 15 x 1 = 15

TYPE – A			TYPE - B		
1	d	Transposan	1	c	Hilum
2	d	Explant	2	d	CFC and Co_2
3	a	AUG	3	d	(1) - (iii), (2) - (i), 3 - (iv), (4) - (ii)
4	d	(1) - (iii), (2) - (i), 3 - (iv), (4) - (ii)	4	d	niche
5	d	Alkaline phosphatase	5	b	Microspore
6	d	2 - 10%	6	d	Transposan
7	d	CFC and Co_2	7	a	Community→ Ecosystem→ Landscape → Biome
8	a	Community→ Ecosystem→ Landscape → Biome	8	d	2 10%
9	b	Microspore	9	a	intravarietal
10	a	Plasmid Boliver and Rodriguez	10	b	Bacteria
11	d	niche	11	a	Green co yledon
12	a	Green cotyledon	12	d	Alkaline phosphatase
13	c	Hilum	13	a	Plasmid Boliver and Rodriguez
14	b	Bacteria	14	d	Explant
15	a	intravarietal	15	a	AUG

PART – II

Answer any six questions. 6 x 2 = 12

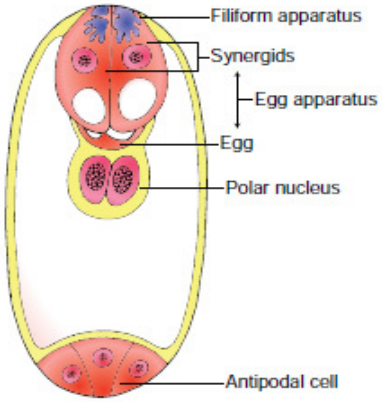
Question No. **24** is compulsory.

16	In Some species the inner layer of the in egument may become specialized to perform the nutritive function for he embryo sac and is called as endothelium or integumentary tapetum	2
17	Test cross is crossing an individual of unknown genotype with a homozygous recessive.	2
18	The transcription start site contains about 25 bp upstream. The sequence is TATAAT known as TATA (or) Hogness box. (or) A specific sequence of DNA nucleotides act as Promoter which is necessary for transcription, is called TATA box where transcription begins	2
19	i) Restriction enzymes ii) DNA Ligase iii) Alkaline phosphatase } Any two	2
20	**Jumping genes** transposable genetic elements are called as jumping genes. **(or)** DNA sequences which can move from one position to another position in a genome.	2
21	The movement of ene gy from producers upto top carnivores is known as food chain.	2
22	1. Used to build up railway carriage. 2. Used to build up wagon. 3.Used to build up Ship - building. 4. Used to build up bridge - building. 5. Used to make boats. 6. Used to make toys. 7. Used to make plywood 8. Used to make door frames. 9. Used to make doors. } Any two	2
23	The interaction between organisms, when continues for generations.Involves reciprocal changes in genetic and morphological characters of both organisms.	2
24	The fusion product of protoplasts without nucleus of different cells.	2

PART – III

Answer any six of the following 6 x 3 = 18

Question Number **33** is compulsory

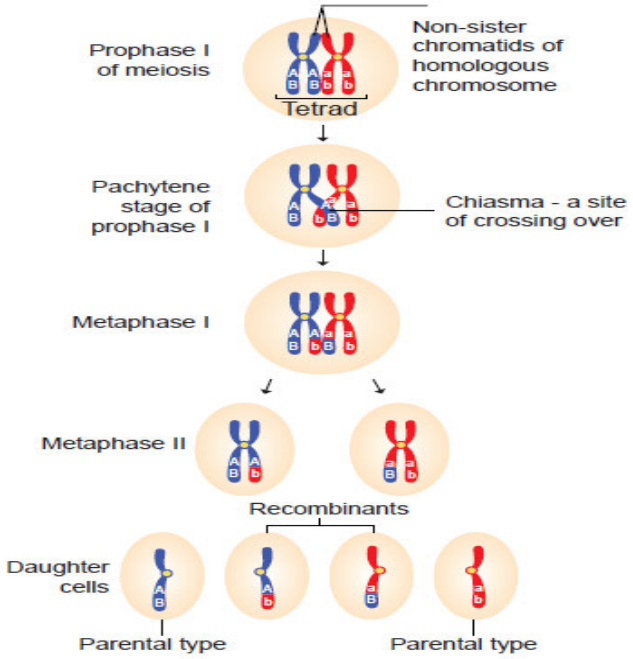
25	1. Must able to replicate autonomously.(Must contain origin of replication) 2. It should be small in size (Less than 10kb). 3. It Should contain a suitable marker. 4. It should have unique target sites. **Any three points**	3
26	The Phenomenon in which two alleles are both expressed in the heterozygous individual. Eg: 1. Red and white flowers of *Camellia.* 2. Inheritance of Sickle cell haemoglobin } Any one eg 3. ABO blood group.	2 1
27	 Diagram : 2 Marks Parts (Any 2) : 1 Mark	3
28	**Primary Introduction**: When the Introduced variety is well adapted to the new environment without any alternation to the original genotype. **Secondary Introduction**: When the Introduced variety in subjected to selection to isolate a superior variety and hybridized with a local variety to transfer one or a few characters to them.	3
29	The change in the temperature profile with increasing depth in a water body is called thermal stratification. There are three evels of thermal stratifications: - 1. Epilimnion 2. Metalimnion 3. Hypolimnion	2 1
30	1. Phytoplankton stage 2. Submerged plant stage. 3. Submerged free-floating stage. 4. Reed - Swamp stage. 5. Marsh meadow stage.	3

	6. Shrub stage. 7. Forest stage.		
31	Total amount of green house gases produced by human activities such as agriculture, industries, deforestration, waste disposal,burning fossil fuels directly or indirectly is called Carbon foot print.		3
32	**Coding Strand**	**Non - Coding strand**	3
	1. The other names are Coding strand/ Non - template Strand/ Sense strand. 2. The other strand of DNA which is not transcribed is called coding strand. The direction is 5' → 3'.	1. The other names are template strand/ Non - coding Strand/ Antisense strand. 2 The strand of DNA which is oriented in 3' → 5' direction that serves as a template for the synthesis of mRNA is cal ed template strand.	
33	Sterilization is the technique employed to get rid of microbes such as bacteria and fungi in the culture medium, vessels and explants 1. Floor and walls are washed first with detergent and then with 2% sodium hypochlorite 2. 95% ethanol. 3. Exposure of UV radiation for 15 minutes **Any One point**		2 1

PART – IV

Answer all questions 5 x 5 = 25

34 a	It is the innermost layer of anther wall. **Types:-** 1. Secretory tapetum or Parietal/ glandular/cellular. 2. Invasive tapetum or Periplasmodial. **Functuions:-** • It supplies nutrition to the developing microspores. • It contributes sporopollenin through **ubisch bodies** thus plays an important role in pollen wall formation. Any three points • The pollenkitt material is contributed by tapetal cells and is later transferred to the pollen surface • Exine proteins responsible for '**rejection reaction**' of the stigma are present in the cav ties of the exine.	1 1 3

34.b	**Eg:**4 O' clock plant (or)*Mirabilis jalapa* Explanation (**OR)** Flow Chart Ratio: (1:2:1)	1 3
35.a	Crossing over is a biological process that produces new combination of genes by inter changing the corresponding segments between non-sister chromatids of homologous pair of chromosomes.  	2 3
35.b	Single cell proteins are dried cells of microorganism that are used as protein supplement in human foods or animal feeds. **Applications of Single-Cell Protein** Any three points • It is used as protein supplement • It is used in cosmetics products for healthy hair and skin • It is used as the excellent source of protein for feeding cattle, birds fishes etc. • It is used in food industry as aroma carriers, vitamin carrier, emulsifying agents to improve the nutritive value of baked products, in soups, in ready-to-serve-meals, in diet recipes • It is used in industries like paper processing, leather processing as foam stabilizers.	2 3

36.a	**Totipotency,** **Differentiation,** **Redifferentiation,** **Dedifferentiation**	1
	Totipotency The prope ty of live plant cells that they have the genet c potential when cultured in nutrient medium to give rise to a complete individual plant.	1
	Differentiation The process of biochemical and structural changes by which cells become specialized in form and func ion.	1
	Redifferentiation The further differentiation of already differentiated cell into another type of cell. For example, when the component cells of callus have the ability to form a whole plant in a nutrient medium, the phenomenon is called redifferentiation.	1
	Dedifferentiation The phenomenon of the reversion of mature cells to the meristematic state leading to the formation of callus is called dedifferentiation.	1
36.b	**Ephemerals** **Succulents** **Non - Succulents**	1
	Ephemerals (explanation with any one example)	1
	Succulents (explanation with any one example)	1½
	Non succulent plants(explanation with any one example)	1½
37.a	Type of Ecosystem: Two types of ecosystem 1. Natural Ecosystem 1 (with or without human interference) 2. Artificial or manmade ecosystem 1 Eg : Rice field and Maize field Natural Ecosystem two types : 1 Terrestrial ecosystem 1/2 Ex: Forest ecosystem Grass land ecosystem Desert ecosystem 2 Aquatic ecosystem 1/2	5

	(open water) Aquatic ecosystem two types : 1 Fresh water ecosystem 1/2 2 Marine ecosystem 1/2 Fresh wa er ecosystem two types : 1. Lotic 1/2 (Running water bodies) Ex: River,Spring and stream) 2. Lentic 1/2 (Standing water bodies) Ex : Pond and Lake **(Anyone example for each type)**	
37.b	1. Methods of solid waste management includes Landfill, incineration, recovery, recycling, composting, and pyrolysis. 2. Technological advancement for processing treatment and disposal of solid waste helps in converting it into renewable energy and organic manure. 3. Electronic waste contains toxic materials and are found to be non-biodegradable which causes threat to human health and the smoke during recycling and leaching causes great threat to water bodies. Agricultura landfills method stands a good method to reduce these problems.	2 1 2
38.a	Seed storage in cryopreservation Seed storage in gene bank Svalbard seed bank Seed storage in cryopreservation(explanation) Seed storage in gene bank(explanation) Svalbard seed bank(explanation)	1 2 1 1
38.b	**Common Name** / **Useful parts** / **Uses** Holy basil / Leaves & Roots / Leaves are 1.stimulant, 2.antiseptic, 3.anti-hypertensive, 4. anti-bacter al, and 5. expectorant used in	1

			bronchitis. 6. Decoction of roots is given as a diaphoretic in malarial level.	
	Indian gooseberry	Fruit	1. Potent rejuvenator, 2. immune modulator 3. has an anti-ageing property. 4. helps to promote longevity, 5. enhance digestion, 6. treat constipation and 7. reduce fever and 8. cough	1
	Indian acalypha	Leaves	1. Used to cure skin diseases caused by ringworms, 2. Powdered leaves used to cure bedsores and infected wounds.	1
	Vilvam	Fruit	1. Unripe fruit is used to treat stomach indigestion problems. 2. Kills In estinal parasites.	1
	Veldt grape	Stem and root	1. Paste obtained from the powdered stem and root is used to treat bone fracture. 2. whole plant is used to treat asthma and stomach troubles.	1
(Any one useful part and use for each plant: 1 Mark)				