



**ISLAMIAH MAT HR SEC SCHOOL,
KILAKARAI, RAMANATHAPURAM DT.**

XII COMMON PUBLIC EXAMINATION, MAY -2022 (23-05-2022)

**TENTATIVE ANSWER KEY
Question type A**

SUB: BOTANY

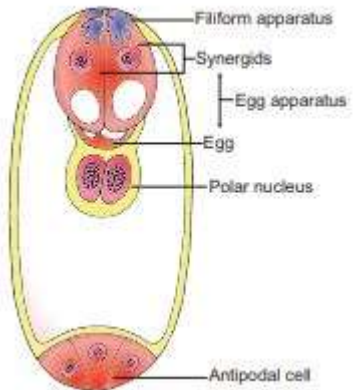
MARKS: 70

Q.NO	CONTENT	MARKS	MODE OF QUESTION
	PART -I		
I.	CHOOSE THE CORRECT ANSWER	15 X 1 =15	BOOK BACK / BOOK INSIDE/ CREATIVE
1	d. Transposon	1	BOOK INSIDE
2	d. Explant	1	BOOK INSIDE
3	a. AUG	1	BOOK BACK
4	a. (1)-(iii), (2)-(iv), (3)-(i), (4)- (ii)	1	BOOK BACK
5	d. Alkaline phosphatase	1	BOOK INSIDE
6	d. 2-10%	1	BOOK BACK
7	d. CFC and CO ₂	1	BOOK BACK
8	a. Community→Ecosystem→Landscape→Biome	1	BOOK BACK
9	b. Microspore	1	BOOK BACK
10	a. Plasmid Boliver and Rodriguez	1	BOOK BACK
11	d. niche	1	BOOK BACK
12	a. Green cotyledon	1	BOOK INSIDE
13	c. Hilum	1	BOOK BACK
14	b. Bacteria	1	BOOK BACK
15	a. intravarietal	1	BOOK BACK

Q.NO	CONTENT	MARKS	MODE OF QUESTION
II.	PART -II ANSWER ANY SIX OF THE FOLLOWING QUESTION NUMBER 24 IS COMPULSORY	6 X 2 = 12	BOOK BACK / BOOK INSIDE/ CREATIVE
16	In some species (unitegmic tenuinucellate) the inner layer of the integument may become specialized to perform the nutritive function for the embryo sac and is called as endothelium	2	BOOK BACK
17	Test cross is crossing an individual of unknown genotype with a homozygous recessive. Test cross is used to identify whether an individual is homozygous or heterozygous for a dominant Character	2	BOOK INSIDE
18	The transcription start site contains about 25 bp (base pairs) upstream, the sequence is TATAAT known as TATA	2	BOOK BACK
19	restriction enzymes, DNA ligase and alkaline phosphatase	2	BOOK INSIDE
20	Transposons (Transposable elements or mobile elements) are DNA sequence able to insert itself at a new location in the genome without having any sequence relationship with the target locus and hence transposons are called walking genes or jumping genes	2	BOOK INSIDE
21	The movement of energy from producers up to top carnivores is known as food chain	2	BOOK INSIDE
22	It is one of best timbers of the world. The heartwood is golden yellow to golden brown when freshly sawn, turning darker when exposed to light. Known for its durability as it is immune to the attack of termites and fungi. The wood does not split or crack and is a carpenter friendly wood. It was the chief railway carriage and wagon wood in India. Ship building and bridge-building depends teakwood. It is also used in making boats, toys, plywood, door frames and doors. (Any two point)	2	BOOK INSIDE
23	The interaction between organisms, when continues	2	BOOK BACK

	for generations, involves reciprocal changes in gene and morphological characters of both organisms. This type of evolution is called Co-evolution.		
24	The fusion product of protoplasts without nucleus of different cells is called a cybrid.	2	BOOK INSIDE

Q.NO	CONTENT	MARKS	MODE OF QUESTION
	PART -III ANSWER ANY SIX OF THE FOLLOWING QUESTION NUMBER 33 IS COMPULSORY		BOOK BACK / BOOK INSIDE/ CREATIVE
25	<p>1. Vectors are able to replicate autonomously to produce multiple copies of them along with their DNA insert in the host cell.</p> <p>2. It should be small in size and of low molecular weight, less than 10 Kb (kilo base pair) in size so that entry/transfer into host cell is easy.</p> <p>3. Vector must contain an origin of replication so that it can independently replicate within the host.</p> <p>4. It should contain a suitable marker such as antibiotic resistance, to permit its detection in transformed host cell.</p> <p>5. Vector should have unique target sites for integration with DNA insert and should have the ability to integrate with DNA insert it carries into the genome of the host cell. Most of the commonly used cloning vectors have more than one restriction site. These are Multiple Cloning Site (MCS) or polylinker. Presence of MCS facilitates the use of restriction enzyme of Choice</p> <p>(Any three point)</p>	3	BOOK BACK
26	<p>The phenomenon in which two alleles are both expressed in the heterozygous individual is known as codominance.</p> <p>Example: Red and white flowers of Camellia, Inheritance of sickle cell haemoglobin, ABO blood group system in human beings.</p> <p>(Any one eg)</p>	3	BOOK INSIDE

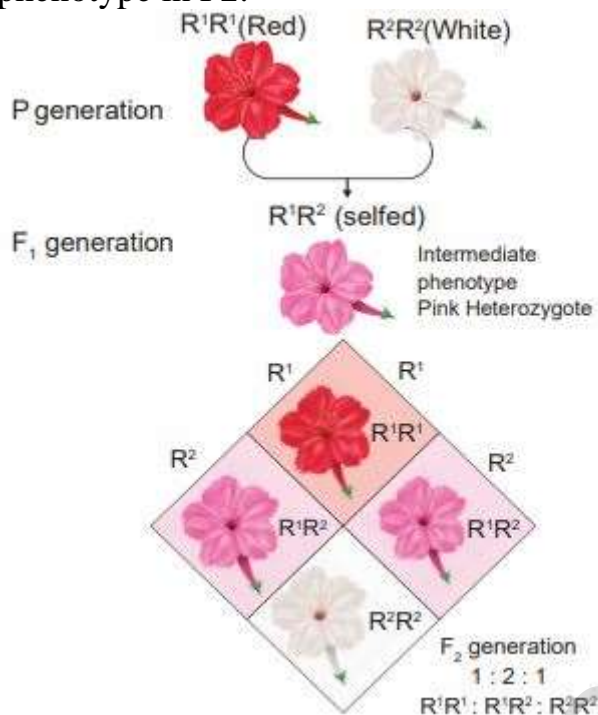
27		3	BOOK INSIDE				
28	<table border="1"> <thead> <tr> <th data-bbox="268 667 651 712">Primary Introduction</th> <th data-bbox="651 667 1034 712">Secondary Introduction</th> </tr> </thead> <tbody> <tr> <td data-bbox="268 712 651 1055"> Primary introduction - When the introduced variety is well adapted to the new environment without any alternation to the original genotype. </td> <td data-bbox="651 712 1034 1055"> Secondary introduction - When the introduced variety is subjected to selection to isolate a superior variety and hybridized with a local variety to transfer one or few characters to them. </td> </tr> </tbody> </table>	Primary Introduction	Secondary Introduction	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 is subjected to selection to isolate a superior variety and hybridized with a local variety to transfer one or few characters to them.	3	BOOK BACK
Primary Introduction	Secondary Introduction						
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 is subjected to selection to isolate a superior variety and hybridized with a local variety to transfer one or few characters to them.						
29	<p>It is usually found in aquatic habitat. The change in the temperature profile with increasing depth in a water body is called thermal stratification. There are three kinds of thermal stratifications.</p> <ol style="list-style-type: none"> 1. Epilimnion 2. Metalimnion 3. Hypolimnion 	3	BOOK BACK				
30	<ol style="list-style-type: none"> 1. Phytoplankton stage 2. Submerged plant stage 3. Submerged free floating stage 4. Reed-swamp stage 5. Marsh meadow stage 6. Shrub stage 7. Forest stage 	3	BOOK BACK				
31	<p>Every human activity leaves a mark just like our footprint. This Carbon footprint is the total amount of greenhouse gases produced by human activities such as agriculture, industries, deforestation, waste disposal, burning fossil fuels directly or indirectly. It can be measured for an individual, family, organization like industries, state level or national</p>	3	BOOK INSIDE				

	level. It is usually estimated and expressed in equivalent tons of CO per year. The burning of fossil fuels releases CO and other greenhouse gases. In turn, these emissions trap solar energy and thus increase the global temperature resulting in ice melting, submerging of low lying areas and imbalance in nature like cyclones, tsunamis, and extreme weather conditions						
32	<table border="1"> <tr> <td>Coding strand</td> <td>Non-Coding Strand</td> </tr> <tr> <td>The other strand of DNA which is not transcribed is called the Coding Strand</td> <td>The strand of DNA which is oriented in 3' → 5' direction that serves as a template for the synthesis of mRNA is called template strand.</td> </tr> </table>	Coding strand	Non-Coding Strand	The other strand of DNA which is not transcribed is called the Coding Strand	The strand of DNA which is oriented in 3' → 5' direction that serves as a template for the synthesis of mRNA is called template strand.	3	BOOK BACK
Coding strand	Non-Coding Strand						
The other strand of DNA which is not transcribed is called the Coding Strand	The strand of DNA which is oriented in 3' → 5' direction that serves as a template for the synthesis of mRNA is called template strand.						
33	<p>Sterilization: Sterilization is the technique employed to get rid of microbes such as bacteria and fungi in the culture medium, vessels and explants.</p> <p>Sterilization of culture room: Floor and walls are washed first with detergent and then with 2% sodium hypochlorite or 95% ethanol. The cabinet of laminar airflow is sterilized by clearing the work surface with 95% ethanol and then exposure of UV radiation for 15 minutes.</p>	3	BOOK INSIDE				

Q.NO	CONTENT	MARKS	MODE OF QUESTION
	PART –IV		
IV.	ANSWER ALL THE QUESTION	5 X 5 = 25	BOOK BACK / BOOK INSIDE CREATIVE
34 (a)	<p>Tapetum: It is the innermost layer of anther wall and attains maximum development at the tetrad stage</p>	5	BOOK BACK

	<p>microsporogenesis</p> <p>Functions of Tapetum:</p> <ul style="list-style-type: none"> • It supplies nutrition to the developing microspores. • contributes sporopollenin through ubisch bodies th • plays an important role in pollen wall formation. • T • pollenkitt material is contributed by tapetal cells and • later transferred to the pollen surface. • Exine prote • responsible for 'rejection reaction' of the stigma • present in the cavities of the exine. These proteins • derived from tapetal cells. 		
34 (b)	<p>Incomplete dominance – No blending of genes The German Botanist Carl Correns's (1905) Experiment - In 4 O' clock plant, Mirabilis jalapa when the pure breeding homozygous red (R1 R1) parent is crossed with homozygous white (R2 R2), the phenotype of the F1 hybrid is heterozygous pink (R1 R2). The F1 heterozygous phenotype differs from both the parental homozygous phenotype. This cross did not exhibit the character of the dominant parent but an intermediate colour pink. When one allele is not completely dominant to another allele it shows incomplete dominance. Such allelic interaction is known as incomplete dominance. F1 generation produces intermediate phenotype pink coloured flower. When pink coloured plants of F1 generation. were interbred in F2 both phenotypic and genotypic ratios were found to be identical as 1 : 2 : 1(1 red : 2 pink : 1 white). Genotypic ratio is 1 R1 R1 : 2 R1 R2 : 1 R2 R2 .From this we conclude that the alleles themselves remain discrete and unaltered proving the Mendel's Law of Segregation. The phenotypic and genotypic ratios are the same. There is no blending of genes. In the F2 generation R1 and R2 genes segregate and recombine to produce red, pink and white in the ratio of 1 : 2 : 1. R1 allele codes for an enzyme responsible for the formation of red pigment. R2 allele codes for defective enzyme. R1 and R2 genotypes produce only enough red pigments to make the flower pink. Two R1 R1 are needed for producing red flowers. Two R2 R2 genes are needed for white flowers. If blending had taken place, the original pure traits</p>	5	BOOK INSIDE

would not have appeared and all F₂ plants would have pink flowers. It is very clear that Mendel's particulate inheritance takes place in this cross which is confirmed by the reappearance of original phenotype in F₂.

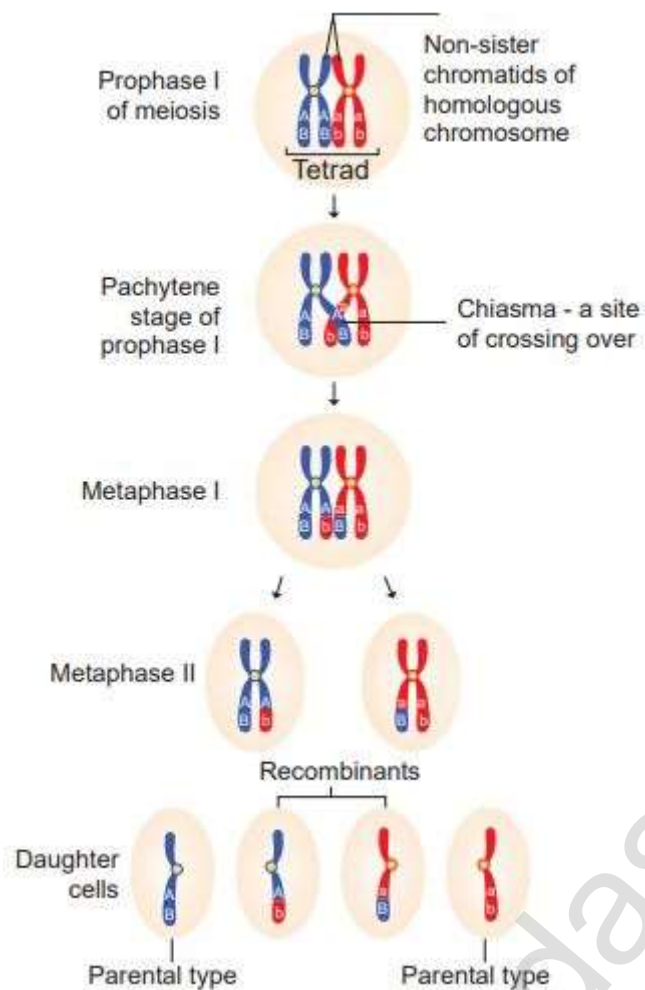


35 (a)

Crossing Over Crossing over is a biological process that produces new combination of genes by interchanging the corresponding segments between non-sister chromatids of homologous pair of chromosomes.

5

BOOK BACK



35 (b) Single Cell Protein (SCP)
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

- It is used as protein supplement
- It is used in cosmetics products for healthy hair and skin
- It is used in poultry as the excellent source of proteins and other nutrients, it is widely used 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.

5

BOOK INSIDE

36 (a)	<p>Basic concepts of Tissue Culture Basic concepts of plant tissue culture are totipotency, differentiation, dedifferentiation and redifferentiation.</p> <p>Totipotency The property of live plant cells that they have the genetic potential when cultured in nutrient medium to give rise to a complete individual plant.</p> <p>Differentiation The process of biochemical and structural changes by which cells become specialized in form and function.</p> <p>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.</p> <p>Dedifferentiation The phenomenon of the reversion of mature cells to the meristematic state leading to the formation of callus is called dedifferentiation. These two phenomena of redifferentiation and dedifferentiation are the inherent capacities of living plant cells or tissue. This is described as totipotency.</p>	5	BOOK BACK
36 (b)	<p>Based on adaptive characters xerophytes are classified into three categories. They are Ephemerals, Succulents and Non succulent plants.</p> <p>i. Ephemerals: These are also called drought escapers or drought evaders. These plants complete their life cycle within a short period (single season). These are not true xerophytes. Examples: Argemone, Mollugo, Tribulus and Tephrosia.</p> <p>ii. Succulents: These are also called drought enduring plants. These plants store water in their plant parts during the dry period. These plants develop certain adaptive characters to resist extreme drought conditions. Examples: Opuntia, Aloe, Bryophyllum and Begonia.</p> <p>iii. Non succulents: These are also called drought resistant plants (true xerophytes). They face both external and internal dryness. They have many adaptations to resist dry conditions. Examples: Casuarina, Nerium, Zizyphus and Acacia.</p>	5	BOOK INSIDE

37 (a)	<p style="text-align: center;">Ecosystem</p> <pre> graph TD E[Ecosystem] --> NE[Natural Ecosystem (With or without human interference)] E --> AE[Artificial or Manmade Ecosystem (Artificially maintained by man) Example: Rice field and Maize field] NE --> TE[Terrrestrial Ecosystem Example: Forest ecosystem Grass land ecosystem Desert ecosystem] NE --> AQ[Aquatic ecosystem (Open water)] TE --> FWE[Fresh water ecosystem] TE --> ME[Marine ecosystem] FWE --> L[Lotic (Running water bodies) Example: River Spring and Stream] ME --> Lentic[Lentic (Standing water bodies) Example: Pond and Lake] </pre>	5	BOOK INSIDE
37 (b)	<p>All non liquid wastes which causes health problems and unpleasant living environment leading to pollution. Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It is all about how it can be changed and recycled as a valuable resource. Methods of solid waste management includes Landfill, incineration, recovery, recycling, composting, and pyrolysis</p> <ul style="list-style-type: none"> • Technological advancement for processing treatment and disposal of solid waste helps in converting it into renewable energy and organic manure. • 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. Agricultural landfills method stands a good method to reduce these problems 	5	BOOK INSIDE
38 (a)	Modern Methods of Seed Storage a. Seed storage in cryopreservation: It is the technique of germplasm	5	BOOK BACK

	<p>conservation (storage of cells, tissue, embryo or seeds) by ultra-low temperature in liquid nitrogen at -196°C. It is not practical for commercial seed storage purpose, but is useful to store the valuable germplasm for use in future which cannot be preserved by conventional methods. b. Seed storage in gene bank: In gene bank, seed storage is the preservation of seed under controlled environmental condition which will prolong the viability of the seeds for long periods. The temperature, relative humidity and seed moisture content. Containers and distribution arrangement vary for each and every type of seed. c. Svalbard seed bank: The seeds are stored in four ply sealed envelopes, and then placed into plastic tote containers on metal shelving racks. The storage rooms are kept at -180°C. The low temperature and limited access to O₂ will ensure low metabolic activity and delayed seed ageing. The permafrost surrounding will help to maintain low temperature of the seed when the electricity supply fails.</p>																				
38 (b)	<table border="1"> <thead> <tr> <th data-bbox="256 1167 422 1205">Plant name</th> <th data-bbox="422 1167 544 1205">Plant part</th> <th data-bbox="544 1167 1046 1205">Medicinal use</th> </tr> </thead> <tbody> <tr> <td data-bbox="256 1205 422 1429">Holy basil</td> <td data-bbox="422 1205 544 1429">Leaves and root</td> <td data-bbox="544 1205 1046 1429">The leaves are stimulant, antiseptic, anti-hypertensive and anti-bacterial and expectorant used in bronchitis. Decoction of roots is given as a diaphoretic in malarial fever.</td> </tr> <tr> <td data-bbox="256 1429 422 1653">Indian gooseberry</td> <td data-bbox="422 1429 544 1653">Fruit</td> <td data-bbox="544 1429 1046 1653">It is a potent rejuvenator and immune modulator. It has anti-ageing properties. It helps promote longevity, enhance digestion, treat constipation and reduce fever and cough.</td> </tr> <tr> <td data-bbox="256 1653 422 1843">Indian acalypha</td> <td data-bbox="422 1653 544 1843">Leaves</td> <td data-bbox="544 1653 1046 1843">Used to cure skin diseases caused by ringworms. Powdered leaves are used to cure bedsores and infected wounds.</td> </tr> <tr> <td data-bbox="256 1843 422 1955">Vilvam</td> <td data-bbox="422 1843 544 1955">Fruit</td> <td data-bbox="544 1843 1046 1955">The unripe fruit is used to treat problems of stomach indigestion. It kills intestinal parasites.</td> </tr> <tr> <td data-bbox="256 1955 422 2024">Veldt grape</td> <td data-bbox="422 1955 544 2024">Stem and</td> <td data-bbox="544 1955 1046 2024">Paste obtained from the powdered stem and root of this plant is</td> </tr> </tbody> </table>	Plant name	Plant part	Medicinal use	Holy basil	Leaves and root	The leaves are stimulant, antiseptic, anti-hypertensive and anti-bacterial and expectorant used in bronchitis. Decoction of roots is given as a diaphoretic in malarial fever.	Indian gooseberry	Fruit	It is a potent rejuvenator and immune modulator. It has anti-ageing properties. It helps promote longevity, enhance digestion, treat constipation and reduce fever and cough.	Indian acalypha	Leaves	Used to cure skin diseases caused by ringworms. Powdered leaves are used to cure bedsores and infected wounds.	Vilvam	Fruit	The unripe fruit is used to treat problems of stomach indigestion. It kills intestinal parasites.	Veldt grape	Stem and	Paste obtained from the powdered stem and root of this plant is	5	BOOK INSIDE
Plant name	Plant part	Medicinal use																			
Holy basil	Leaves and root	The leaves are stimulant, antiseptic, anti-hypertensive and anti-bacterial and expectorant used in bronchitis. Decoction of roots is given as a diaphoretic in malarial fever.																			
Indian gooseberry	Fruit	It is a potent rejuvenator and immune modulator. It has anti-ageing properties. It helps promote longevity, enhance digestion, treat constipation and reduce fever and cough.																			
Indian acalypha	Leaves	Used to cure skin diseases caused by ringworms. Powdered leaves are used to cure bedsores and infected wounds.																			
Vilvam	Fruit	The unripe fruit is used to treat problems of stomach indigestion. It kills intestinal parasites.																			
Veldt grape	Stem and	Paste obtained from the powdered stem and root of this plant is																			

	root	used in bone fractures. Whole plant is useful to treat asthma and stomach troubles.		
--	------	-------------------------------------------------------------------------------------	--	--

M.MATHAN., M.Sc., M.Ed., M.Phil.,
PGT IN BOTANY,
ISLAMIAH MAT HR SEC SCHOOL,
KILAKARAI, RAMANATHAPURAM DT.,
9865330431

- Daily classes by **Namakkal Well Experienced Staff**
- Two year integrated program for **XI and XII - NEET.**
- We provide online test for both **NEET.**
- Weekly intensive test for **NEET.**
- We teach from basics make you achievers.
- Learn with interest without stress.
- Daily practice test and monthly cumulative test for state board.
- Extra care for slow learners.