

VILLUPURAM DLST.

Class : 12Register
Number**COMMON QUARTERLY EXAMINATION - 2024 - 25**

Time Allowed : 3.00 Hours]

BOTANY
PART - I

[Max. Marks : 70

15x1=15

I. Answer All the questions.

- In which techniques Ethidium Bromide is used?
 - Southern Blotting techniques
 - Western Blotting techniques
 - Polymerase Chain Reaction
 - Agrose Gel Electroporosis
- The prevention of large scale loss of biological interity
 - Biopatent
 - Bioethics
 - Biosafety
 - Biofuel
- Match list I with list II

List I	List II
A. $2n + 2$	i) Monosomy
B. $2n + 1$	ii) Tetrasomy
C. $2n - 1$	iii) Trisomy
D. $2n - 1 - 1$	iv) double monosomy
a) A-i, B-iii, C-ii, D-iv	b) A-ii, B-iii, C-iv, D-I
c) A-ii, B-iii, C-i, D-iv	d) A-iii, B-ii, C-i, D-iv
- Persistent nucellus in the seed is known as
 - Hilum
 - Tegman
 - Chalaza
 - Perisperm
- Majority of plants pollen is liberated at
 - 1 celled stage
 - 2 celled stage
 - 3 celled stage
 - 4 celled stage
- Match the columns

i) Hind III	-	a) Chlorella
ii) pBR 322	-	b) Restriction enzyme
iii) SCP	-	c) Antibiotic resistance gene
iv) ampR	-	d) Cloning vector
a) i - c, ii - a, iii - d, iv - b		b) i - c, ii - d, iii - b, iv - a
c) i - b, ii - d, iii - a, iv - c		d) i - b, ii - d, iii - c, iv - a
- EcoRI cleaves DNA at
 - AGGGTT
 - GTATATC
 - GAATTC
 - TATAGC
- In his classic experiments on Pea plants, Mendel did not use
 - Flowering position
 - Seed colour
 - Pod length
 - Seed shape
- Choose the incorrect pair from the following
 - Bt toxin - Bacillus thuringiensis
 - Electrophoresis - Separation of DNA fragments
 - Golden rice - Vitamin K
 - Hind II - Endonuclease enzyme
- Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acid?
 - UUA, UCA - Leucine
 - GUU, GCU - Alanine
 - UAG, UGA - Stop
 - AUG, ACG - Start / Methionine
- Crossing over is a precise process that includes stages like
 - Tetrad formation, crossover, synopsis, terminalisation
 - Terminalisation, cross over, tetrad formation, synopsis
 - Crossing over, tetrad formation, synopsis, terminalisation
 - Synopsis, tetrad formation, crossover and terminalisation
- Extra nuclear inheritance is a consequence of presence of genes in
 - Mitochondria and chloroplasts
 - Endoplasmic reticulum and mitochondria
 - Ribosomes and chloroplast
 - Lysosomes and ribosomes

V / 12 / Bot / 1

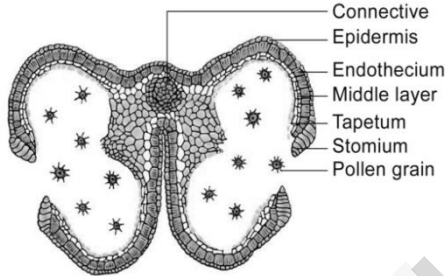
School Education - Villupuram district
Higher Secondary Second year - Quarterly Examination - 2024
Botany – Key Answer

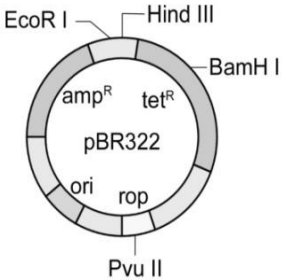
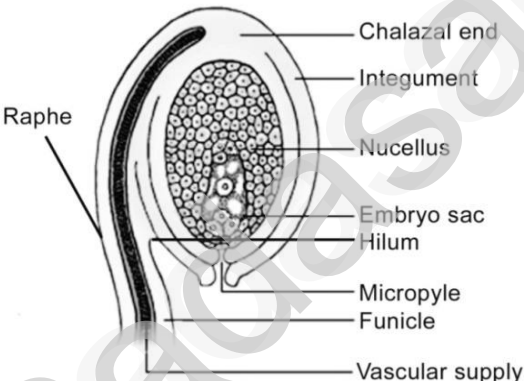
I. Answer All the questions**15 x 1=15**

Q. NO	Part - I		Marks
1	d)	Agrose Gel Electroporosis	1
2	c)	Biosafety	1
3	c)	A-ii, B-iii, C-i, D-iv	1
4	d)	Perisperm	1
5	b)	2 celled stage	1
6	c)	i -b, ii -d, iii - a, iv - c	1
7	c)	GAATTC	1
8	c)	Pod length	1
9	c)	Golden rice - Vitamin K	1
10	c)	UAG, UGA – Stop	1
11	d)	Synopsis, tetrad formation, crossover and terminalisation	1
12	a)	Mitochondria and chloroplasts	1
13	b)	A is correct. R is wrong	1
14	c)	At very low temperature of -196 by using liquid nitrogen	1
15	a)	10 micrometer	1

II. Answer any six questions. Question No. 24 is Compulsory.**6 x 2 =12**

Part - II			
16.	Lethal allele An allele which has the potential to cause the death of an organism is called lethal allele. Ex : Snapdragon		2
17.	<ul style="list-style-type: none"> ➤ Waste water from potato processing plants ➤ Straw ➤ Molasses ➤ Animal manure and even sewage 	(Any 3)	2
18.	Cantharophily Pollination takes place by beetle is called cantharophily.		2
19.	Castor Aruna. <ul style="list-style-type: none"> ➤ Castor Aruna is mutant variety of castor. ➤ Which is developed by treatment of seeds with thermal neutrons. It induce very early maturity. 120 days instead of 270 days as original variety. 		1 1
20.	Polyembryony Presence of more than one embryo in a seed is called polyembryony.		2
21.	Rediscovered Mendelism – Scientists Name Hugo de Vries Carl Correns Erich von Tschermak		2
22.	Chemicals used in gene transfer Polyethylene glycol (PEG) Dextran sulphate		1 1
23.	TATA Box A specific sequence of DNA nucleotides called the Promoter is necessary for transcription. It consists of TATA nitrogen bases		2

24.	Cybrid The fusion product of protoplasts without nucleus of different cells is called a cybrid	2																																
PART - III																																		
Answer any six questions. Question No. 33 is Compulsory		6 x 3=18																																
25.	Secretory tapetum (parietal / glandular / cellular) The tapetum retains the original position and cellular integrity and nourishes the developing microspores. Invasive tapetum (periplasmodial) The cells lose their inner tangential and radial walls and the protoplast of all tapetal cells coalesces to form a periplasmodium.	1 1/2 1 1/2																																
26.	Capping Modification at the 5' end of the primary RNA transcript (hnRNA) with methylguanosine triphosphate is called capping. Tailing The 3' end of hnRNA is cleaved by an endonuclease and a string of adenine nucleotides is added to the 3' end of hnRNA is known as tailing or polyadenylation.	1 1/2 1 1/2																																
27.	 <p style="text-align: right;">(Any 4 Parts)</p>	Dig - 2 Parts - 1																																
28.	Name the seven contrasting traits of Mendel.																																	
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29.	Types of Blotting techniques.																																	
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30.	Cryopreservation The protoplasts, cells, tissues, organelles, organs, extracellular matrix, enzymes or any other biological materials are preserved in a very low temperature of -196°C by using liquid nitrogen are called cryopreservation.	3																																

31.	S.NO	Missense mutation	Nonsense mutation	3
	1.	The mutation where the codon for one amino acid is changed into a codon for another amino acid is called Missense mutations.	The mutations where codon for one amino acid is changed into a termination or stop codon is called Nonsense mutation.	
32.	Intellectual property right (IPR). <ul style="list-style-type: none"> ➤ IPR is a category of property. ➤ It includes intangible creation of the human intellect, and primarily consists of copyrights, patents, and trademarks. ➤ It also includes other types of rights, such as trade secrets, publicity rights, moral rights, and rights against unfair competition. 			1 1 1
33.	pBR 322  <p>amp^R - Ampicillin Resistance Gene tet^R - Tetracycline Resistance Gene</p>			Dig - 2 Parts - 1
Part – IV				
Answer all the questions				5 x 5=25
34.	Ovule – Structure - Explanation 			3 Dig - 2
34. (OR)	Basic concepts of plant tissue culture <p>Totipotency</p> <ul style="list-style-type: none"> ➤ 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>Differentiation</p> <ul style="list-style-type: none"> ➤ The process of biochemical and structural changes by which cells become specialized in form and function. ➤ Meristematic tissue into mature cells. <p>Dedifferentiation</p> <ul style="list-style-type: none"> ➤ The reversion of mature cells to the meristematic state leading to the formation of callus is called dedifferentiation. ➤ Mature cells into the meristematic tissue. ➤ Formation of callus is called dedifferentiation. <p>Redifferentiation</p> <ul style="list-style-type: none"> ➤ The component cells of callus have the ability to form a whole plant in a nutrient medium is called redifferentiation. 			2 1 1 1

35.	<p>Incomplete dominance Example : 4 o' clock plant / Mirabilis jalapa</p> <p>Explanation (OR) Diagram</p> <p>Parent Red White R^1R^1 R^2R^2</p> <p>Gametes R^1 R^2</p> <p>$F_1 =$ R^1R^2 (pink colour)</p> <p>F_1 (Selfed) = $R^1R^2 \times R^1R^2$</p> <p>$F_2 =$</p> <table border="1" data-bbox="589 527 1089 722"> <thead> <tr> <th>Gametes</th> <th>R^1</th> <th>R^2</th> </tr> </thead> <tbody> <tr> <th>R^1</th> <td>R^1R^1 Red</td> <td>R^1R^2 Pink</td> </tr> <tr> <th>R^2</th> <td>R^1R^2 Pink</td> <td>R^2R^2 White</td> </tr> </tbody> </table> <p>Phenotypic Ratio : 1 : 2 : 1</p>	Gametes	R^1	R^2	R^1	R^1R^1 Red	R^1R^2 Pink	R^2	R^1R^2 Pink	R^2R^2 White	1 3 1
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35. (OR)	<p>Direct gene transfer method Yes</p> <p>Chemical mediated gene transfer</p> <ul style="list-style-type: none"> ➤ Certain chemicals like polyethylene glycol (PEG) and dextran sulphate induce DNA uptake into plant protoplasts. <p>Microinjection</p> <ul style="list-style-type: none"> ➤ The DNA is directly injected into the nucleus using fine tipped glass needle or micro pipette to transform plant cells. <p>Electroporation Methods</p> <ul style="list-style-type: none"> ➤ A pulse of high voltage is applied to protoplasts, cells or tissues which makes transient pores in the plasmamembrane through which uptake of foreign DNA occurs. <p>Liposome mediated method of Gene Transfer</p> <ul style="list-style-type: none"> ➤ Liposomes the artificial phospholipid vesicles are useful in gene transfer. ➤ The gene or DNA is transferred from liposome into vacuole of plant cells. ➤ Liposome and tonoplast of vacuole fusion resulted in gene transfer. ➤ This process is called lipofection. <p>Biolistics</p> <ul style="list-style-type: none"> ➤ The foreign DNA is coated onto the surface minute gold or tungsten particles (1-3 μm) and bombarded onto the target tissue or cells using a particle gun. (Any 4 Methods) 	1 4									
36.	<p>Gene mapping</p> <ul style="list-style-type: none"> ➤ The diagrammatic representation of position of genes and related distances between the adjacent genes is called genetic mapping. <p>Uses</p> <ul style="list-style-type: none"> ➤ It is used to determine gene order, identify the locus of a gene and calculate the distances between genes. ➤ It is useful in predicting results of dihybrid and trihybrid crosses. ➤ It allows the geneticists to understand the overall genetic complexity of particular organism. 	2 3									
36. (OR)	<p>Characters of Anemophilous plant</p> <ul style="list-style-type: none"> ➤ Flowers in pendulous, catkin like or spike inflorescence. ➤ The perianth is absent or highly reduced. ➤ The flowers are small, colourless, not scented, do not secrete nectar. ➤ The stamens are numerous, filaments are long, exerted and versatile. ➤ Enormous quantity of pollen grains. compared to number of ovules available for pollination. ➤ Minute, light, dry pollen easily carried by wind to long distances. (Any 5 Points) 	5									

