

12th QUARTERLY EXAM - BOTANY (LV)
std.

I Choose the correct options :- (15 × 1 = 15)

Q.no	Option	Answer	Mark
1	c	A-ii, B-iii, C-i, D-iv	1
2	d	Vegetative multiplication of plants using small explants	1
3	b	GAATTC	1
4	a	Nucellus - Nutritive tissue for developing embryo	1
5	d	Co-dominance	1
6	c	RNA Pol II	1
7	b	Agrose Gel Electrophoresis	1
8	a	Four	1
9	b	Embryo sac	1
10	c	Callus undergoes differentiation and produces somatic embryoids	1
11	c	200 micrometer	1
12	d	iv, iii, i, iv	1
13	c	Epistatic	1
14	d	Splicing	1
15	a	Agar (b)	1

II Answer any six questions. Q.no 24 Compulsory
(6×2=12)

16 Bioremediation:- The use of microorganisms or plants to manage environmental pollution. It is an approach used to treat wastes including wastewater, industrial waste and solid waste. - 2 marks

17) Callus:- Callus is a mass of unorganized growth of plant cells or tissues in *in vitro* culture medium. - 2 marks

18. Sub-aerial modifications any two.

- a) Rhizome - *Musa parasidiaca*, *Zingiber officinale*, *Curcuma longa*.
- b) Corm - *Amorphophallus*, *Colocassia*
- c) Tuber - *Solanum tuberosum*.
- d) Bulb - *Allium cepa*.

- a) Runner - *Centella asiatica*
 - b) Sucker - *Chrysanthemum*
 - c) Stolon - *Mentha*, *Fragaria*
 - d) Offset - *Pistia*, *Eichhornia*
- } any two
1 mark each

II Answer any six questions. Q.no 24 compulsory
(6 × 2 = 12)

16. Bioremediation :-

The use of microorganisms or plants to manage environmental pollution. It is an approach used to treat waste including wastewater, industrial waste and solid waste
- 2 marks

17. Callus :- Callus is a mass of unorganized growth of plant cells or tissues in invitro culture medium.
- 2 marks

18. Sub aerial modification - any two.

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b) Sucker - *Chrysanthemum*

c) Stolon - *Mentha*, *Fragaria*

d) Offset - *Pistia*, *Eichhornia*

19. Write Advantages of Bt cotton: any two points - 2 marks

- i) Yield of cotton is increased due to effective control of bollworms
- ii) Reduction in insecticide use in the cultivation of Bt cotton.
- iii) Potential reduction in the cost of cultivation.

20) True breeding line :-

A true breeding line means it has undergone continuous self pollination having stable trait inheritance from parent to off springs
- 2 marks

21. Multiple Alleles :-

When any of the three or more allelic forms of gene occupy the same locus in a given pair of homologous chromosomes, they are said to be called multiple alleles
- 2 marks

22 Energetics of DNA replication:-

Deoxyribonucleotides such as deoxyadenosine triphosphate dATP, dGTP, dCTP and dTTP provide energy for the synthesis of DNA. Purpose of Deoxyribonucleotides

- i) acts as a substrate
- ii) provide energy for polymerisation

- 2 marks

23 Two strategy - Bisexual flowers prevent self-pollination:

- i) Dichogamy
 - ii) Herkogamy
 - iii) Heterostyly
 - iv) Self-sterility
- } any two (1+1)
2 marks

24 Missense

- 1) Non-Synonymous
- 2) Change in amino acid encoded

1 mark

Nonsense

Termination
Creates translational termination codon
(UAA, UAG or UGA)

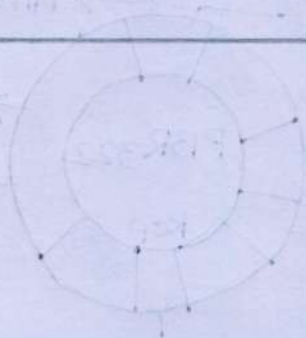
1 mark

III Answer any 6 questions. Q. no 33 compulsory
(6 × 3 = 18)

25. RNA Editing :- Transcriptional RNA processing in plants, chemical modification such as base modification, nucleotide insertion or deletion and nucleotide replacements of mRNA results in the alternation of amino acid sequence of protein that is specified is called RNA editing.

26. Embryoids :- Somatic embryogenesis is the formation of embryos from the callus tissue directly and these embryos are called Embryoids. — 1 marks

Applications — any two points
— 2 marks



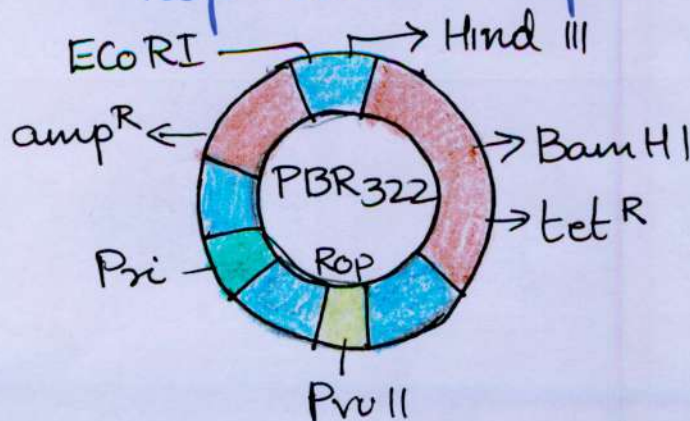
27 Incomplete Dominance	Co-Dominance
1) When one allele is not completely dominant to another allele eg :- <i>Mirabilis jalapa</i> (Flower - colour) 2) New phenotype is formed	Simultaneous expression of both alleles in the heterozygote <i>Camelia</i> (Flower colour) No new phenotype is formed. 3 contrasting points

28 pBR322 - reconstructed plasmid.
4361 base pairs; 322 - Laboratory number

B - Boliver

R - Rodriguez

Rop codes - proteins in replication



Dia Notes

1/2 + 1/2

3 marks

29. Endothecium is associated with dehiscence of anther. The cells along the junction of two sporangia of an anther lobe lack thickenings - this region is called Stomium. This region along with the hygroscopic nature of endothecium helps in the dehiscence of anther at maturity - 3 marks

30. Advantages of Artificial Seeds.

Any 3 points - 3 marks

- 1) It is easy to test the genotype of plants.
- 2) They produce identical plants.
- 3) Millions of artificial seeds can be produced at any time at low cost.
- 4) They can potentially stored for long time under cryopreservation.
- 5) They provide an easy method to produce genetically engineered plants with desirable traits.

31. Seven Contrasting traits - Mendel 3 marks

Character	Dominant Trait	Recessive Trait
1) Plant height	Tall	Dwarf
2) Pod Shape	Inflated	Constricted
3) Cotyledon colour	Yellow	Green
4) Flower position	Axial	Terminal
5) Flower colour	Purple	White
6) Seed shape	Round	Wrinkled
7) Pod colour	Green	Yellow

*
32

Grafting

Two different plants are joined so that continue to grow as one plant.

- 1) Bud grafting
 - 2) Approach grafting
 - 3) Crown grafting
 - 4) Wedge grafting
 - 5) Tongue grafting
- eg :- Rose.

Layering

The stem of parent plant is allowed to develop roots while still intact.

- 1) Mound layering
 - 2) Air layering
- eg :- Oxora

1½ + 1½ marks

33 Mutation :- Duplication - 1 mark

The process of arrangement of the same of genes repeated more than once in the chromosome is known as duplication. Due to duplication some genes are present in more than two copies. It was first reported in *Drosophila* by Bridges and other examples are Maize and Pea. 2 marks

IV Answer in detail :- Any five ($5 \times 2 = 25$)

34 a) Restriction Enzymes :- It cleaves DNA into fragments at or near specific recognition sites within the molecule. 2 marks

It is classified into

- i) Restriction Endonuclease - within the DNA
- ii) Restriction Exonuclease. end of the DNA - 3 marks.

b) Chloroplast inheritance.

Flow chart - 3 marks

Notes - 2 marks

35) Crossing Over

a)

Notes - 3 marks.

Diagram - 2 marks.

i) Synapsis — a) Procentric
b) Proterminal
c) Random.

ii) Tetrad Formation

iii) Cross Over.

iv) Terminalisation

35b) Entomophilous Flowers

Any 5 points - 5 marks.

36a) Monohybrid cross :- It involves the inheritance of two alleles of a single gene — 1 mark

Phenotypic :- 3:1	1 marks
Genotypic :- 1:2:1	

Notes :- 1 mark.

Flow chart :- 2 marks

36b) Basic Concepts of Plant Tissue Culture

Totipotency - 1 mark

Differentiation - 1 mark

Dedifferentiation - 1 mark

Redifferentiation - 1 mark

Diagram - 1 mark

37a) Types of Ovules

- 1) Orthotropous - Piperaceae
- 2) Anatropous - Dicots + Monocots
- 3) Hemianatropous - Primulaceae
- 4) Campylotropous - Leguminosae
- 5) Amphitropous - Alismaceae
- 6) Circinotropous - Cactaceae.

Notes - 4 marks Diagram - 1 mark

37b) Cryopreservation

- -196°C in liquid Nitrogen
- Organelles
- Cryoprotectants

} 5 marks

38) Sulton and Boveri Concept.

a) 4 points - 5 marks.

38)b) Properties of Vector

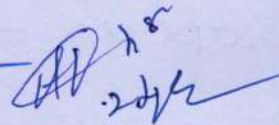
- i) Origin of replication
 - ii) Selectable marker
 - iii) Cloning site
- } 5 marks.

Subject Handling Teachers:-


Mr. Robert


Mr. Mathan.S.M


Mrs. Valareena
24/9.

HM Signature :- 
24/9