

Class: M.Sc. II Semester: IV

Paper XIII:

Long Questions:

1. Describe structure and function of Ribosomes
2. Describe process of transcription in Prokaryotes
3. Describe process of transcription in Eukaryotes
4. Explain types and function of RNA
5. Describe process of translation mechanism in prokaryotes
6. Explain differences between translation in prokaryotes and eukaryotes
7. Describe types and factors of DNA damage
8. Describe DNA repair system
9. Explain fine structure of gene
10. Explain classical and modern concept of gene
11. Describe positive and negative control of regulation of gene expression
12. Describe lactose operon model
13. Describe tryptophan operon model and attenuation of trp operon model.
14. Describe post translation modification
15. Explain protein sorting to plastids
16. Explain protein sorting to mitochondria
17. Explain protein sorting to nucleus
18. Explain protein sorting to vacuoles
19. Explain recombination in phage and mapping phage genes
20. Describe mapping of bacterial genes through transformation
21. Describe mapping of bacterial genes through conjugation
22. Describe mapping of bacterial genes through transduction
23. Describe molecular mechanism of recombination
24. Describe role of RecA and RecBCD enzymes in recombination process.
25. Describe homologous recombination and compare it site specific recombination
26. Explain chromosome mapping using linkage
27. Describe apoptosis and its pathway
28. Explain calcium-calmodulin cascades in signal transduction
29. Describe cytokinesis and cell plate formation
30. Explain role of cyclins and cyclin dependent kinases in signal transduction.

31. Explain electrophoresis and their types.

Short Questions: Write short notes on

1. 70s Ribosome
2. 80s Ribosome
3. mRNA transport
4. RNA splicing
5. Role of rRNA
6. tRNA and its function
7. Single base change
8. DNA damage due to physical factors
9. Chemical factors responsible for DNA damage
10. Mismatch Repair
11. Transition and Transversion
12. SOS response
13. RNA splicing
14. Cis-trans test
15. Riboswitch
16. Protein glycosylation
17. Genome of chloroplast
18. Genome of mitochondria
19. Role of cyclic nucleotides
20. Diversity in protein kinases
21. FISH
22. GISH
23. Confocal microscopy
24. CDKs
25. Retinoblastoma
26. E2F protein
27. Apoptosis
28. Phospholipid signaling

Paper XIV:

Long Questions:

1. Write down in detail principal and scope of tissue culture, different types of media used in tissue culture and application of plant tissue culture
2. Write in detail transgenic methods used to introduce gene in plants
3. Describe principles and techniques used in gene cloning
4. Describe vectors and their types and their properties.
5. Describe construction of cDNA library
6. Describe construction of genomic DNA library.
7. Describe process of t-DNA transfer.
8. Describe different strategies to develop transgenic plants.
9. Describe bacterial transformation and selection of transformants/recombinants
10. Describe protein profiling and its significance.
11. Describe DNA sequencing. Explain in brief any one method of DNA sequencing.
12. Describe polymerase chain reaction and their modifications
13. Describe different types of tissue culture media.
14. Explain haploid formation.
15. Explain production of somatic embryos
16. Describe methods of cybrid formation
17. Describe database and types of databases.
18. Describe nomenclature of DNA and protein sequences.

Short Questions: Write short notes on

1. Morphogenesis
2. Expression vector
3. Screening of DNA libraries
4. Agrobacterium natural genetic engineer
5. Transposon mediated gene tagging
6. T-DNA gene tagging
7. Functional genomics
8. DNA fingerprinting
9. Callus induction
10. Suspension culture

11. Application of plant tissue culture
12. Salient achievement in crop biotechnology
13. Triploid production
14. Primary database
15. Secondary database

Special Paper XV: Molecular Biology & Plant Biotechnology

Long Questions:

1. Describe cell suspension culture and bioreactor (any type) for enhanced multiplication of cell suspensions.
2. Describe somatic hybridization and culture of somatic hybrids
3. Describe haploid production and its significance in crop improvements
4. Describe factors affecting cell suspension culture
5. Describe factors affecting single cell culture
6. Describe cloning vectors used for transformation of higher plants.
7. Describe structure of Ti plasmid and t-DNA transfer process
8. Describe role of vir genes during t-DNA transfer.
9. Describe structure of Ri plasmid and formation of transgenic plant
10. Describe particle bombardment process in direct gene transfer.
11. Describe transformation of monocots
12. Describe transgene silencing in transgenic plants
13. Describe Agrobacterium mediated gene transfer.
14. Describe transgenic plants expressing insect resistance
15. Describe transgenic plants expressing viral resistance
16. Describe transgenic plant expressing enhanced production of secondary metabolites with suitable example.
17. Describe definition and properties of DNA based marker.
18. Describe types of DNA based markers
19. Describe Process of RAPD marker development and their application in crop improvement.
20. Describe DNA microarrays
21. Describe cDNA-AFLP
22. Describe differential display of mRNA and their advantages and limitations

Short Questions: Write short notes on

1. Cell culture
2. Protoplast isolation
3. Protoplast culture
4. In vitro polyploid culture
5. Ti plasmid
6. Electroporation
7. Pollen transformation
8. Biopesticides
9. Biofertilizers
10. Biodegradable plastics
11. Edible vaccines
12. Industrial enzymes

Special Paper XV: Mycology and Plant Pathology

Long Questions:

1. Describe Koch's postulates with suitable example of disease
2. Describe major epidemics in fungal disease of plants with suitable impacts
3. Describe major milestones in phytopathology of India
4. Explain altered metabolism of plant under fungal stress.
5. Write down in detailed defense mechanism of plants against pathogen.
6. What is plant pathology? Write down in detailed nature and classification of plant pathology
7. Write down in detailed phenomenon of signal transduction in plants.
8. Describe in detail principle of plant disease control and describe the different types of methods used to control the plant diseases
9. Describe classification, nature and general symptoms of plant diseases
10. Describe structural, and biochemical defense mechanism of plants against fungal pathogens
11. Describe chemical methods of plant disease control
12. Describe transgenic crop approach for plant disease control.
13. Describe integrated pest management.
14. Describe symptoms, disease and control measures for smut of wheat.
15. Describe symptoms, disease cycle and control measures for downy mildew of jowar.
16. Describe symptoms, disease cycle and control measures of ergot of Bajra.
17. Describe post harvest fungal diseases of fruits.
18. Describe symptoms, disease and control measures for leaf curl of papaya.
19. Describe symptoms, disease and control measures for bunchy top of banana.
20. Write in detail any four diseases of cereals with their control measures.
21. Write in detail any four diseases of vegetable crops with their control measures.
22. Write in detail any four diseases of oil seeds crops with their control measures.
23. Write in detail any four diseases of fruit crops with their control measures
24. Write in detail Mycoplasma diseases of plants
25. Write in detail Phytoplasma diseases of plants
26. Write in detail different types of fungal diseases causes in plants, Mention any three fungal diseases caused in to plants with effective control measures

Short Questions: Write short notes on

1. Historical developments of chemical protection measures of diseases.
2. Epidemiology
4. Indian Institutes and their research activities in plant pathology
5. Signal transduction in plant fungus interaction
6. Toxins secreted during plant fungus interaction
7. Biopesticides
8. general symptoms of plant diseases
9. Control measures of false smut of rice
10. Phenomenon of pathogenicity of microorganisms
11. Symptoms of foot rot of wheat
12. Fungal diseases of Groundnut
13. Fungal diseases of Sunflower
14. Fungal diseases of Mango
15. Fungal diseases of Apple.
16. Symptoms of fire blight of apple
17. symptoms of Tundu diseases of wheat
18. Symptoms of viral diseases of tobacco
19. Control measures of citrus greening
20. Control measures of little leaf of Brinjal
21. Control measures of nematode diseases of plants
22. Host parasite relationship and their interactions.
23. Role of enzymes in defense mechanism in plants
24. Role of phenolic compounds in defense mechanism in plants
25. Role of toxins in defense mechanism in plants.
26. Cultural method used in plant disease control.
27. Chemical method used in plant disease control.
28. Biological methods used in plant disease control.
29. Transgenic approach for plant disease control
30. Fungal diseases on onion and their management
31. Fungal diseases on bhindi and their management
32. Effect of Fungal diseases on Linum/Linseed

33. Fungal diseases on Sesamum and their management
34. Fungal diseases on groundnut and their management
35. Fungal diseases on Mustard crop and their management
36. Fungal diseases on sunflower and their management
37. Fungal diseases on citrus and their management
38. Fungal diseases on Apple and their management
39. Fungal diseases on Mango and their management
40. Fungal diseases on Banana and their management
41. Fungal diseases on Grapes and their management
42. Angular leaf spot of cotton,
43. Stalk rot of Maize
44. Yellow vein mosaic of Bhindi
45. Mosaic of cucurbits
46. Viral diseases on Tobacco
47. Viral diseases on Tomato
48. Viral diseases on Potato

Paper XVI: Plant resources

Long Questions:

1. Describe morphology and anatomy of fibres in fibre yielding plants with suitable examples.
2. Describe morphology of gum and resin yielding plants with suitable examples.
3. Describe anatomical features of spices.
4. Describe classification of crude drugs
5. Describe chemical and biological evaluation of drugs
6. Describe organoleptic and microscopic evaluation of drugs
7. Describe drug adulteration and methods to identify adulterated drugs.
8. Describe classification and plant resources of alkaloids
9. Describe classification and importance of terpenoids
10. Describe classification and properties of phenolics
11. Describe plant description, cultivation and chemical composition of Tea.
12. Describe plant description, cultivation and chemical composition of Coffee.
13. Describe plant description, cultivation and chemical composition of Cocoa.
14. Describe classification of rubber and sources and cultivation process.
15. Write in detail different methods used in paper making and the different types of paper made from paper pulp.
16. What are beverages? Describe in detail methods used in cultivation and manufacturing of beverages.
17. Write in detail description, Chemical nature and methods used in extraction of dyes.
18. Write in detail occurrence, extraction methods used in production of essential oils.
19. Write in detail classification of rubber and different types of methods used for extraction of rubber and their uses

Short Questions: Write short notes on

1. Ergastic substances
2. Trichomes
3. Properties of glycosides

4. Properties of steroids
5. Properties of alkaloids
6. Structure of alkaloid
7. Structure of terpenoid
8. Structure of phenolic compound
9. Kinds of paper and paper products
10. Chemical composition of Cocoa
11. Chemical nature of Dyes
12. Extraction of essential oils
13. Processing of rubber
14. Chemical nature of dyes
15. Extraction method of dyes
16. Methods to used extraction of essential oils
17. Essential oils used in perfumery and others industries
18. Classification and uses of rubber
19. Methods to used collection of rubber plant latex.
20. Uses of rubber
21. Methods to used manufacturing of wood pulp.
22. Kinds of paper and paper products
23. Cultivation of beverages
24. Manufacturing of beverages