

# QUESTION BANK

## MBTT 201: GENETICS

### Explain the term/ Definition

(2 Marks)

1. Allel
2. Allelic frequency
3. Aneuploidy
4. Chromosomal aberration
5. Conjugation
6. Crossing over
7. Epigenetics
8. Euploidy
9. Gene frequency
10. Genotypic frequency
11. Homologous recombination
12. Karyotyping
13. Linkage
14. Linkage groups
15. Linkage map
16. Molecular karyotyping
17. Multiple alleles
18. Non homologous recombination
19. Pedigree
20. Phenocopy
21. Pleiotropy
22. Polygenic inheritance
23. Speciation
24. Three point cross
25. Transformation
26. Transduction
27. Translocation
28. Trisomy
29. Two point cross
30. Phenocopy

### **Long answer questions (6 Marks)**

1. Explain in detail Mendelian principles of Segregation and independent assortment.
2. Explain in detail Mendelian principles of Dominance and independent assortment
3. What is extra chromosomal inheritance? Explain the inheritance in chloroplast..
4. What is chromosomal aberration? Explain the different changes occurred in chromosomal number.
5. What is Quantitative genetics? Explain the concept of human population and gene pool.
6. What is recombination? Explain in detail homologous recombination.
7. What is extra chromosomal inheritance? Explain the inheritance in mitochondria.
8. What is gene mapping? Describe the different methods used for mapping of genes.
9. What is chromosomal aberration? Explain the different changes occurred in chromosome at structural level.
10. What is Pedigree? Explain the construction of pedigree with its significance.
11. What is recombination? Explain in detail non-homologous recombination.
12. Give the detail account of Codominance, incomplete dominance with extension of Mendelian principles.
13. What is crossing over? Explain the mechanism and theory of crossing over.
14. What is karyotyping? Explain in detail FISH; a molecular karyotyping.
15. Explain the mechanism of transformation.

### **Short answer questions (4 Marks)**

1. Explain the concept of transformation.
2. What is Oncogenes? Describe the genetics of Cancer.
3. Explain in detail sex-duction.
4. What is Quantitative genetics? Explain the allele frequencies.
5. Describe the concept of gene pool.
6. Explain Hardy Weinberg's Law.
7. Write a note on mitochondrial inheritance.
8. Describe principle of codominance,
9. Explain the abnormal karyotype and its implications.
10. Write a note on conjugation.
11. Write a note on Epigenetics
12. What is non-homologous recombination?
13. Explain the concept of Human Population and gene pool.

14. What is heritability? How it is measure?
15. What is Quantitative genetics? Explain the concept of modes of speciation
16. Comment on autosomal and sex linked disorders.
17. What is linkage? Explain coupling and repulsion hypothesis.
18. Write a note on Chromosomal Aberrations and Syndromes associated with it:
19. What is Molecular Karyotyping? Explain the FISH.
20. Describe the genetics in aging.
21. What is Pedigree? Explain the construction of pedigree.
22. What is Molecular Karyotyping? Explain the m- FISH.
23. Enlist methods in molecular karyotyping. Explain qF- PCR
24. Define linkage. What are the types of linkage?
25. Write a note on Inheritance of chloroplast.
26. What is linkage? Explain linkage groups.
27. What is the difference between Euploidy and Aneuploidy
28. What is Molecular Karyotyping? Explain the m BAND.

## MBTT 202: Immunology and Virology

### Q1. Explain the term

(2 Mark)

- |                           |                           |
|---------------------------|---------------------------|
| 1. Adjuvants              | 16. Immuno-diagnosis      |
| 2. Autoimmunity           | 17. Immunotherapy         |
| 3. Baltimore system       | 18. Infectivity assays    |
| 4. Biosafety              | 19. Mitogen               |
| 5. BSL-1                  | 20. Mitogen               |
| 6. BSL-2                  | 21. Monoclonal Antibodies |
| 7. BSL-3                  | 22. NOD mouse             |
| 8. Cell mediated immunity | 23. Nude mouse            |
| 9. Epidemic diseases      | 24. Pandemic diseases     |
| 10. Epidemiology          | 25. Plaque assay          |
| 11. Hapten                | 26. SCID mouse            |
| 12. Hybridoma technology  | 27. Sporadic Diseases     |
| 13. Hypersensitivity      | 28. Super antigen         |
| 14. ICTV                  | 29. Xenotransplantation   |
| 15. Immunodeficiency      | 30. Xenotransplantation   |

### Q. 2 Write a note on

(6 Mark)

1. Describe alternate pathway of complement activation.
2. Describe classical pathway of complement activation.
3. Describe lectin pathway of complement activation.
4. Describe the components of innate and adaptive immunity.
5. Describe the mechanism of replication of Pox virus.
6. Explain the different Serological and Molecular methods used for viral diagnosis.
7. Explain the mechanism of retroviral replication.
8. Explain the treatment of autoimmune diseases.
9. What are antibodies? Explain its types with suitable structures.
10. What are Antiviral drugs? Explain their mechanism with suitable example.
11. What are Knock out mice? Give their applications.
12. What are monoclonal antibodies? Explain their production.
13. What are subunit vaccines? Explain with its types.
14. What are xenotransplants? Explain their clinical features.
15. Write a note of genetically engineered MAbs.

16. Write a note on Baltimore classification of viruses.
17. Write a note on epidemiology of H1N1.
18. Write a note on graft rejection and its types.
19. Write a note on inactivated killed vaccines.
20. Write a note on structure of MHC class I molecule.
21. Write a note on structure of MHC class II molecule.
22. Write a note on type II hypersensitivity.

**Q 3. Attempt the following**

**(4 Mark)**

1. Explain the different modes of transmission of plant viruses.
2. Describe the Clinical symptoms of Foot and mouth disease viral infection.
3. Write a note on Morphology and ultrastructure of Viruses.
4. Write a note on action of antiviral drug amantadine.
5. Describe the ultrastructure of viruses.
6. Describe the Molecular methods for detection of viruses.
1. What are viral vaccines? Explain with suitable types.
2. Explain the mechanism of action of antiviral drug acyclovir.
3. Write a note on Morphology and ultrastructure of Viruses.
4. Write a note epidemiology of H5N1 virus.
5. Describe the prevalence of Nipah virus.
6. Mode of transmission TMV virus.
7. Write a note on SARS virus.
8. Describe the Replication and Symptoms of TMV.
9. Write a note on Cancer Immunology.
10. Write a note on Antibody A and its transport
11. What is adjuvant and explain their types
12. Write advantages and disadvantages of MAB
13. Write a note on structure of MHC class II molecule
14. Write a note on type IV: delayed type of hypersensitivity along with their phases
15. Describe various factors influencing immunogenicity.
16. Write a note on Baltimore classification of viruses.
17. Describe the General properties of viruses.
18. Explain the cultivation of viruses.

## MBTT 203: Plant Biotechnology

### Q 1. Attempt the following

(2 Mark)

1. Single cell protein
2. Algal Biofuel
3. What are Flavonoids
4. Suspension culture
5. Biotic stress
6. ISSR
7. Plantibodies
8. What are Lignins
9. Any two uses of Agar agar
10. Any two uses of Alginates
11. Any two uses of saponins
12. Scientific name of Oyster mushroom
13. Any two uses of flavonoids
14. Any two uses of *Spirulina*
15. What is Alginates
16. What is Temperature stress
17. Any two uses of lignins
18. SSR
19. What is agar agar
20. Scientific name of button mushroom
21. State any two molecules used in plant defense
22. Any two uses of algal pigments
23. What is Carragenan
24. What is Drought stress
25. RAPD
26. Scientific name of shittake mushroom
27. Edible vaccine
28. What are Saponins
29. Any two uses of *Chlorella*
30. What is cold stress

31. Any two uses of *Dunaliella*
32. What is salt stress
33. Any two uses of Seaweeds
34. Any two uses of Mushroom
35. Write two methods of seaweed cultivation

**Q 2. Attempt the following**

**(6 Mark)**

1. Write a note on *Lintinus* and write its economic importance.
2. Write a note on Phycocolloids and write its economic importance.
3. Explain the plant phytochemical- carotenoids.
4. Use of plant cell culture for production of secondary metabolites.
5. Describe non vector mediated transformation methods.
6. Write a note on development of transgenic plants for biotic stress.
7. Write a note on *Pleurotus* cultivation and write its economic importance.
8. Write a note on *Dunaliella* and write its economic importance.
9. Write a note on *Chlorella* and write its economic importance.
10. Write a note on *Agaricus* and write its economic importance.
11. Explain the plant phytochemical- glycosides.
12. What are secondary metabolites? state their use in plant defense mechanism.
13. Describe vector mediated transformation methods.
14. Use of plant cell culture as chemical factories for secondary metabolites.
15. Explain the plant phytochemical- Anthocyanins.
16. Describe *Agrobacterium* mediated transformation methods.
17. Write a note on development of transgenic plants for abiotic stress.
18. Write a note on development of transgenic plants for abiotic stress.
19. Write a note on *Spirulina* and write its economic importance.
20. Write a note on algal biofuels and write its economic importance.
21. Write a note on use of plant tissue culture for production of secondary metabolites.
22. Explain the plant phytochemical- Lignins and Anthocyanins in short.
23. Describe in detail process of *Agrobacterium* mediated transformation methods.
24. Write a note on development of transgenic plants for Salt stress and its applications.
25. Explain the plant phytochemical- carotenoids and Saponins in short.

26. Describe process for biolistic mediated transformation methods.
27. Write a note on development of transgenic plants for Fungi stress and its applications.
28. Write a note on Oyster mushroom cultivation and write its economic importance.
29. Write a note on Button mushroom and write its economic importance.
30. Write a note on Shittake mushroom and write its economic importance.

**Q 3. Attempt the following**

**(4 Mark)**

1. Write a note on molecular farming for improvement in lipids.
2. Write a note on plantibodies.
3. Write a note on applications of Plantibodies.
4. Write a note on ISSR marker.
5. Write a note on *Spirulina* and their uses.
6. Write a note on applications ISSR and RAPD.
7. Write a note on oyster mushroom cultivation.
8. What are theraputic application of plant secondary metabolites.
9. Write a note development of fungi resistant transgenic plants.
10. Write a note on applications plant secondary metabolites in plant defence.
11. Describe the ISSR markers.
12. Write a note on applications AFLP and SSR
13. What is manipulation in nitrogen fixation for increase in plant productivity.
14. Write a note on molecular farming for improvement in proteins.
15. Write a note on Edible vaccine.
16. Write a note on AFLP marker.
17. Write a note on algal biofuel.
18. Write a note on seaweed cultivation.
19. What are plant alkaloids.
20. Describe the ISSR markers.
21. Write a note development of viruses resistant transgenic plants.
22. Write a note on applications of molecular farming for improvement in Lipids.
23. Write a note on applications of molecular farming for improvement in Proteins.
24. Write a note on development process for molecular farming for improvement in carbohydrates.

25. Write a note on development process for molecular farming for improvement in Proteins.
26. What is manipulation in photosynthesis for increase in plant productivity.
27. Write a note on RAPD.
28. Write a note on eco- TILLING.
29. Write a note on molecular farming for improvement in carbohydrates.
30. Write a note on algal pigments.
31. Write a note on uses of algal biofuels.
32. Write a note on uses of Biolistic method.
33. Write a note on uses of Carragenan.
34. Write a note on uses of mushroom with example.
35. Write a note on development process for molecular farming for improvement in Lipids.
36. What are Terpenes.
37. Write a note on uses of agar agar.
38. Write a note on uses of Tepenes and flavonoids.
39. Describe the SSR markers.
40. Write a note development of salt resistant transgenic plants.
41. Describe the Biolistic method of transformation.
42. Write a note development of cold resistant transgenic plants.
43. Write a note on applications of molecular farming for improvement in carbohydrates.
44. Write a note on uses of Saponins and Lignins.
45. Write a note on any two uses of Agar agar and carragenan

## Question bank MBTT 204: ENVIRONMENTAL BIOTECHNOLOGY

FOR 2 MARKS:

1. What is the term biofiltration in waste management?
2. What is acid rain?
3. What are xenobiotics compounds?
4. What is bioaugmentation in waste management?
5. What is BOD?
6. What do you mean by aerobic lagoons.
7. Briefly explain biostimulation?
8. What is ozone hole?
9. Name few greenhouse gases?
10. What is COD?
11. What is EMS?
12. What is bioremediation?
13. What is phytoremediation?
14. What do you mean by activated sludge?
15. What is EIA?
16. What are anthropogenic causes of air pollution
17. Explanation of fabric filter technique
18. What are two treatment processes for removal of VOCs.
19. Draw a cyclone collector device in particulate pollutant removal
20. Draw a spray tower device in particulate pollutant removal
21. What is biostimulation
22. What is an oxidation pond
23. What is TOC
24. What are trickling filters
25. What is 'Media' in RBC.
26. Why discs are thin in RBC.
27. Name four methanogenic bacteria in biogas production
28. What is a facultative pond?
29. Name fungi which can degrade DDT.
30. What is Biomagnification.

**FOR 6 MARKS:**

1. What are global environmental problems? Discuss sources and effects of greenhouse gases on global warming and measures to control greenhouse effects.
2. Discuss problems, importance, needs, scope and phases of Environmental Management Plan preparation.
3. Diagrammatically represent aerobic composting process, its stages & organisms involved.
4. Diagrammatically represent Rotating Biological Contactors process for removal of MSW.
5. What is ozone hole? Discuss the sources and effect of depletion of ozone on living system & its control measurement.
6. What is hospital waste management? Discuss categories of medical wastes and various steps involved in hospital waste management.
7. Diagrammatically represent activated sludge process for industrial sewage treatment.
8. What are biotechnological methods for management of pollution? Explain atmospheric CO<sub>2</sub> reduction by different biotechnological approaches.
9. What are global environmental problems? Discuss sources, causes and effects of ozone depletion on global warming and its measures to control.
10. What is EIA? Discuss steps and benefits of conducting EIA.
11. Diagrammatically represent Rotating Biological Contactors process for sewage waste removal
12. What is ozone hole? Discuss sources, causes and effects of ozone depletion on global warming and measures to control.
13. Diagrammatically represent methane production process & discuss the stages & organisms involved.
14. Diagrammatically represent & discuss activated sludge process for industrial waste.
15. Diagrammatically represent Rotating Biological Contactors process of MSW.
16. Define xenobiotics? Give examples of xenobiotic compounds and discuss method of xenobiotics degradation
17. Explain aerobic composting process, stages and organisms involved.
18. Explain acid rain and its effect on living and nonliving things.
19. Explain Biogas production process and steps & organisms involved.
20. What is ozone hole? Write chemical reactions involved in generation and depletion of ozone. Discuss the effect of depletion of ozone on living systems.
21. Discuss objectives of Environmental Impact Assessment and stages of EIA process
22. Discuss the steps & organisms involved in the methane production process.

23. Diagrammatically represent Rotating Biological Contactors process for treatment of sewage.
24. Write a note on Pseudomonas- a predominant microbes for bioremediation
25. Explain air pollution control by any two techniques.
26. Diagrammatically represent activated sludge process.
27. Discuss aerobic suspended growth treatment process.
28. Discuss any two control devices for removal of particulate matters in air pollution.
29. Discuss immobilized cells for management of pollution.
30. Explain air pollution control by any two technique used in industries.
31. Discuss compost formation process. Discuss stages & organisms involved in compost formation.
32. What is environmental management? Discuss problems, scopes and need of environmental management plan.
33. What are global environmental problems? Discuss causes, sources and impact of acid rain on global warming and measures to control.
34. What is biogas? Discuss biogas generation process, stages and microbes involved in the process.

#### **4 MARK QUESTIONS:**

1. What are global environmental problems? Discuss sources, causes and effects of ozone depletion.
2. Explain ozone depletion process and its effect on living and nonliving things.
3. Diagrammatically represent air particulate pollution control by cyclone collector
4. Diagrammatically represent and explain air pollution control by any one technique used in industries.
5. What is compost formation process? Discuss stages & organisms involved in compost formation.
6. What is acid rain? Discuss the causes and effect of acid rain on the living and non-livings
7. What are xenobiotics? Discuss one method of xenobiotics degradation.
8. What is anaerobic digestion process of methane production? What are different stages in the anaerobic digestion?
9. Diagrammatically represent & discuss primary treatment process of sewage/water treatment.
10. What is BOD? Write a note on BOD and water quality.
11. What are acid rains? Discuss effects of acid rain on living and nonliving things?
12. Diagrammatically represent air pollution control by gravity settling chamber technique.
13. Diagrammatically represent activated sludge process.

14. What are different categories of water pollutants? What are their sources?
15. Diagrammatically represent & discuss aerobic suspended growth treatment process.
16. Diagrammatically represent control devices for particulate matters in air pollution.
17. Discuss use of immobilized microorganisms for management of pollution.
18. Diagrammatically represent any one treatment process for removal of VOCs
19. Discuss generation and depletion of ozone and its effects on living things.
20. What is acid rain? Explain effect of acid rain on living and nonliving things.
21. Diagrammatically represent & explain air particulate pollution control by cyclone collector technique.
22. Diagrammatically represent & discuss primary treatment process of sewage treatment.
23. What is trickling filters? Diagrammatically represent trickling filter technology for sewage treatment
24. Diagrammatically represent & discuss preliminary treatment process of sewage.
25. Discuss and diagrammatically represent anaerobic suspended growth treatment process.
26. What do you mean by CO<sub>2</sub> reduction from atmosphere? Explain atmospheric CO<sub>2</sub> reduction by different biotechnological approaches.
27. What is EIA? Discuss steps and benefits of conducting EIA.
28. Discuss preliminary treatment process of sewage/water treatment.
29. Discuss primary treatment process of sewage/water treatment.
30. Discuss secondary treatment process of sewage/water treatment.
31. Discuss causes of ozone depletion and its effect on the living system.
32. Discuss control devices for particulate matters in air pollution.
33. Discuss biogas production process.
34. Diagrammatic representation of aerobic attached-growth treatment process.
35. Discuss control devices for particulate matters in air pollution.
36. Diagrammatically represent aerobic attached-growth treatment process.
37. What is phytoremediation? Discuss phytoremediation for pollution control.
38. Explain green-house gas effect and its impact on living and nonliving things.
39. What is in-situ bioremediation? Discuss in-situ bioremediation process.
40. Discuss advantages & disadvantages of in-situ bioremediation
41. What is Ex-citu bioremediation? Discuss advantages & disadvantages of Ex-situ bioremediation
42. What are metabolic effects of microorganisms on xenobiotics
43. Discuss engineered in-situ bioremediation

44. What are factors affecting bioremediation
45. Write a note on recalcitrant xenobiotics
46. What are types of air pollutants? What is nature of pollutants?
47. What is pollution? classify them on the basis of their origin
48. Write a note on effects of air pollution on human
49. Write a note on effects of air pollution on plants
50. Write a note on effects of air pollution on animals
51. Write a note on effects of air pollution on materials
52. Write a note on microalgae as a photobioreactor
53. Write a note on plants in metal pollution management