

MBTT 401 Genomics and Proteomics

Q1. Explain the term

(2 Mark)

1. Comparative genomics
2. EST
3. Phage display
4. Functional Proteomics
5. Isoelectric Focusing
6. Pharmacogenomics
7. Functional genomics
8. SAGE
9. Microarray
10. Structural Proteomics
11. Dialysis
12. Toxicogenomics
13. Structural genomics
14. Genome annotation
15. SNP
16. Peptidomics
17. Expressional Proteomics
18. Metagenomics

Q 2. Attempt the following

(6 Mark)

1. Describe the technique of metagenomics and give its applications.
2. What is transcriptome profiling? Give its outline.
3. What is Functional Proteomics? Explain with suitable examples.
4. Describe the technique used for Identification and characterization of novel proteins.
5. Describe the principle, working and applications 2D Gel electrophoresis.
6. Explain the concept of structural genomics.
7. What is Structural Proteomics? Explain with suitable examples.
8. What is Toxicoproteomics? Give its applications.
9. What is microarray? Describe Preparation, working and analysis of RNA microarray.
10. What is pharmacogenomics? Give its applications.
11. Describe the principle, working and applications of protein microarray.
12. Describe the technique of Comparative genomics and give its limitations.
13. What is microarray? Describe Preparation, working and analysis of DNA microarray.
14. Write a note on toxicogenomics.
15. What are Biomarkers? Give their applications in disease diagnosis.

16. What is Expressional Proteomics? Explain with suitable example.
17. Explain the suitable technique for large scale DNA sequencing.
18. Describe the principle, working and applications MALDI-TOF Gel electrophoresis.

Q 3. Attempt the following

(4 Mark)

1. Describe the principle and applications of HPLC.
2. Write a note on preparation and working of protein microarray.
3. Describe the technique of Phage display.
4. Explain the suitable omics technique used to study the evolution.
5. Describe the principle of next generation sequencing methods.
6. Describe mapping of genome using suitable techniques.
7. Write a note on Gene disease association.
8. Give applications of microarray technique.
9. Write a note on Drug discovery.
10. Write a note on isoelectric focusing.
11. Describe the applications of MALDI-TOF technique.
12. Give the principle ESI technique?
13. Describe the goals of structural genomics.
14. Give the advantages of next generation sequencing over traditional methods.
15. Write a note on organization of genome in prokaryotes.
16. What are ESTs? Give their applications.
17. Give the principle of metagenomics.
18. Write a note on Biomarkers in disease diagnosis.
19. Explain the principle of HPLC with its application in proteomics.
20. Write a note on 2D gel electrophoresis.
21. What is protein-protein interaction? Give the suitable example.
22. Explain the goals and applications of functional genomics.
23. Write a note on organization of genome in eukaryotes.
24. Describe the techniques used for mapping of genome.
25. Write a note on SAGE.
26. Write a note on transcriptomics.
27. Explain the structural proteomics with suitable example.

MBTT 402: RESEARCH METHODOLOGY AND CLINICAL RESEARCH

2 Marks Questions

1. Define confounded relationship in context of research design
2. Define experimental and control groups in context of research design
3. Define extraneous variables in context of research design
4. Define research hypothesis in context of research design
5. Define treatments in context of research design
6. Distinguish between applied and fundamental research
7. Distinguish between restricted and unrestricted sampling
8. Enlist important features of a research design
9. Enlist the characteristics of a good sample design
10. What is confounded relationship in research?
11. What is declaration of Helsinki
12. What is inclusion and exclusion criteria
13. What is Kefauver amendment
14. What is nuremburg code
15. What is phase 0 trial
16. What is phase 2 trial? How many volunteers are involved in phase 2 trail
17. What is phase 3 trial? How many volunteers are involved in phase 3 trail
18. What is placebo?
19. What is research hypothesis?
20. Write a criteria of good research
21. Write objectives of research
22. What do you mean by GMP?
23. GMP is initiated in which year?
24. GMP deals with what kinds of contaminations?
25. Enlist the regulatory authority in India for drugs

4 Marks Questions

1. Write short notes on: Design of the research project
2. Write short notes on: Ex post facto research
3. Write short notes on: Motivation in research
4. Write short notes on: Objectives of research
5. Write short notes on: Criteria of good research
6. Write short notes on: Research and scientific method
7. Experience survey
8. Pilot survey
9. Components of a research problem
10. Rephrasing the research problem
11. Explain and illustrate two group simple randomized design
12. Explain and illustrate latin square design
13. Explain and illustrate random replications design
14. Explain and illustrate simple factorial design
15. Explain and illustrate informal experimental designs

16. Distinguish between restricted and unrestricted sampling
17. Distinguish between convenience and purposive sampling
18. Distinguish between systematic and stratified sampling
19. Distinguish between cluster and area sampling
20. Write a roles & responsibility of ethics committees IEC
21. Write down microbial safety in GMP
22. What are different principles of GMP
23. What is third party GMP certification?
24. Write a note on Schedule Y of drugs
25. Write a note on cosmetics act
26. Explain the role of FDA
27. Write a note on CFR
28. Explain the role and responsibilities of DCGI
29. Explain the role and responsibilities of CDSCO
30. Write the regulations and guidelines ICH

6 Marks Questions

1. What is IRB? What are role and responsibility of IRB?
2. What is ICH-GCP? What are principles of ICH-GCP?
3. Discuss overview of clinical drug development process. What are different stages of drug development process?
4. Write a note on clinical trial phases
5. Write a note on responsibility of sponsors in clinical trials
6. What is IEC? How many members are there in IEC? Discuss the functions of IEC.
7. What is schedule Y? What are rules under schedule Y? Discuss different appendices under schedule Y.
8. Briefly describe the different steps involved in a research process.
9. How do you define a research problem? Give three examples to illustrate your answer
10. "Research design in exploratory studies must be flexible, but in descriptive studies, it must minimise bias and maximise reliability." Discuss
11. What do you mean by 'Sample Design'? What points should be taken into consideration by a researcher in developing a sample design for this research project.
12. Describe various types of research
13. Write a short note on quantitative research approach
14. Describe basic principles of experimental designs.
15. Enlist different types of sample designs and explain in brief about unrestricted sampling
16. Write a comprehensive note on the "Task of defining a research problem"
17. Explain and illustrate the procedure of selecting a random sample
18. Describe the different types of research, clearly pointing out the difference between an experiment and a survey
19. Write a notes on "Pilot survey"
20. Write down the principles of ICH-GCP
21. What do you mean by research? Explain its significance in modern times.
22. Distinguish between Research methods and Research methodology.

23. "Empirical research in India in particular creates so many problems for the researchers". State the problems that are usually faced by such researchers.
24. "Research is much concerned with proper fact finding, analysis and evaluation." Do you agree with this statement? Give reasons in support of your answer.
25. Describe fully the techniques of defining a research problem.
26. What is research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points.
27. How do you define a research problem? Give three examples to illustrate your answer.
28. What is the necessity of defining a research problem? Explain.
29. "The task of defining the research problem often follows a sequential pattern". Explain.
30. "Knowing what data are available often serves to narrow down the problem itself as well as the technique that might be used." Explain the underlying idea in this statement in the context of defining a research problem.
31. Write a comprehensive note on the "Task of defining a research problem".
32. Explain the meaning and significance of a Research design.
33. Describe some of the important research designs used in experimental hypothesis-testing research study.
34. "Research design in exploratory studies must be flexible but in descriptive studies, it must minimise bias and maximise reliability." Discuss.
35. Give your understanding of a good research design. Is single research design suitable in all research studies? If not, why?
36. Write a short note on 'Experience Survey' explaining fully its utility in exploratory research studies.
37. What is research design? Discuss the basis of stratification to be employed in sampling public opinion on inflation.
38. Explain and illustrate the procedure of selecting a random sample.
39. "A systematic bias results from errors in the sampling procedures". What do you mean by such a systematic bias? Describe the important causes responsible for such a bias.
40. What do you mean by 'Sample Design'? What points should be taken into consideration by a researcher in developing a sample design for this research project.
41. How would you differentiate between simple random sampling and complex random sampling designs? Explain clearly giving examples.
42. Why probability sampling is generally preferred in comparison to non-probability sampling? Explain the procedure of selecting a simple random sample.
43. Under what circumstances stratified random sampling design is considered appropriate? How would you select such sample? Explain by means of an example.
44. Write GMP in processing and packaging of drugs
45. Write a note on phases of clinical trials
46. Write a note on drug development process
47. Briefly explain the types of clinical study designs
48. Write a note on sample size and randomization
49. Write a note on phase 0 clinical trial
50. Briefly explain the types of clinical study designs

MBTT 403: Bio-entrepreneurship and IPR

Q1. Explain the term

(2 Mark)

1. Proprietorship
2. Marketing
3. IPR
4. PCT
5. Partnership
6. Private Limited company
7. LLP
8. Budapest treaty
9. Project report
10. MSME
11. Branding
12. Biosafety regulation
13. Hybridoma technology
14. Genetically modified organisms
15. Budapest Treaty
16. WIPO
17. Plant breeder's rights
18. Transgenic organisms
19. TRIPS
20. Process patent
21. Patent
22. Copyright
23. Tread mark
24. Geographical Indication
25. Design IP

Q 2. Attempt the following**(6 Mark)**

1. What does Entrepreneurial Motivation mean? Explain the important parameters involved in it.
2. Describe the primary and secondary sources in marketing research.
3. Write a note on different types of enterprises.
4. Write a note on different financial institutions fostering bioentrepreneurship.
5. What is PCT? Describe PCT in brief.
6. Describe the International conventions for patenting biological materials.
7. What are the different types of Entrepreneurs? Give the benefits of entrepreneurship.
8. What are the important characteristics for being an entrepreneur? Explain with suitable case study of successful entrepreneur.
9. Describe the overview of basic legal forms of business.
10. What is project report? Give the contents and formulation project report.
11. Write a note on Paris Convention for the Protection of Industrial Property.
12. What are GMOs? Explain the Biosafety measures of GM crops with suitable example.
13. Enlist the different characteristics for being an entrepreneur in biotechnology.
14. What is marketing? Describe the important components of Marketing.
15. Explain the different forms of organizations that can be incorporated under “Company”.
16. What is business plan? Give the important characteristics of business plan.
17. Describe Budapest Treaty.
18. What are GM crops? Explain the merits and demerits of GM crops.

Q 5. Attempt the following**4 Marks**

1. Write a note on Industrial designs
2. Give the outline of patenting process in India.
3. Enlist the types of inventions that are non-patentable in India.
4. Write a note on Types of Microbiological Biosafety Level Facilities.
5. Describe the public concern and global scenario on GM food.
6. Write note on biosafety studies with respect to GM-Soyabean.
7. Write a note on proprietorship.
8. Write a note on example of successful entrepreneur in Biotechnology
9. Write a note on Factors affecting biotech business.
10. Write a note on Plant breeders rights.

11. Describe the prerequisites for patenting.
12. Write a note on copy right.
13. Describe the issues of GM food with respect to Indian Scenario.
14. Write a note on Types of Plant Biosafety Level Facilities.
15. Write a note on Food derived from GM crops.
16. Describe the partnership form of business.
17. Write a note on any two financial institutions in fostering bioentrepreneurship.
18. Write a note on Marketing Limitations for Startups
19. Write a note on types of animal biosafety level facilities.
20. Write a note on Plant breeders rights.
21. Write a note on Biosafety studies with respect to GM cotton.
22. Enlist the criterion for naming the inventions in a patent application.
23. Write a note on trademarks.
24. Describe the Indian and International scenario for Protection of Plant varieties.
25. Describe the four important elements of marketing mix.
26. Write a note on example of successful entrepreneur in Biotechnology
27. Describe the contents and formulation of project report.

MBTT 404: FOOD BIOTECHNOLOGY

For 2 marks

1. What is HTST and LTLT?
2. Which are different mechanisms on which of hurdle technology is based.
3. What is role of lipids & starch in extrusion techniques?
4. Name non-lactic molds as a starter cultures
5. Enlist the name of bacterial culture used in the cheese making process.
6. Which bacterial culture is used in yogurt?
7. What is application of lipids in extrusion techniques?
8. What is E number in food additives?
9. Name few antioxidants used in food industries.
10. Name two food colors used in food processing.
11. What is concept of indicator enzymes in adequate blanching process of food
12. What is blanching process in food processing
13. Enlist microorganisms used in single-cell protein production
14. Enlist the name of bacterial culture used in the cheese making process.
15. Which bacterial culture is used in yogurt?
16. What is MSG and its role in food processing
17. What is blanching process in food processing
18. What is starter culture
19. Enlist microorganisms used in single-cell protein production
20. What is enzymatic browning
21. What is non-enzymatic browning
22. E number of food additives signified for emulsifier and stabilizers
23. What is Maillard reaction
24. What are antioxidants in food additives
25. UHT in milk Pasteurization.
26. What is BHT and its role in food processing
27. What is blanching process in food processing
28. What is canning process in food processing
29. Name two non-lactic molds starter culture
30. Enlist the name of bacterial culture used in the cheese making process.
31. Which bacterial culture is used in yogurt?
32. Enlist few microorganisms used in single-cell protein production
33. Write a full form of HACCP and its aim?
34. Write an objectives of ISI?
35. What is IPR?

For 6 marks:

1. What is hurdle technology? Discuss different types of hurdles applied in food processing.
2. Write a note on fermented meat – sausages

3. What do you mean by non-thermal preservation technique? Describe non-thermal technology in food processing.
4. What is GMP in food industry? Discuss legislations of GMP in food processing industries.
5. Discuss extrusion cooking method of food processing. What are physico-chemical changes occurs in food due to extrusion cooking.
6. Explain the wine fermentation process with flow chart.
7. Discuss mushroom production process.
8. What are food additives? What are types and importance of food additives? Discus food additives and legislations.
9. Discuss food safety and standard regulations. What are the objectives of FPO,
10. Discuss food safety and standard regulations Objectives of MPO.
11. Discuss food safety and standard regulations and objrctives of MMPO
12. What are different drying methods in food processing industries? Discuss effect of drying on food properties.
13. What do you mean by food preservation by thermal technologies? Describe canning process for food preservation.
14. What is food preservation by osmotic dehydration? Describe osmotic dehydration process.
15. What is hurdle technology in food industry? Discuss different types of hurdles applied in food processing.
16. What is HACCP? What are types of hazards in food industries? What are principles of HACCP implementation?
17. What do you mean by non-thermal preservation technique? Describe non-thermal technology in food processing.
18. Describe canning process for food preservation.
19. What is food adulteration? Describe common adulterants in foods and methods of their detection.
20. What is hurdle technology in food industry? Discuss different types of hurdles applied in food processing.
21. Write criteria for the selection of starter culture
22. Write a note on activity and purity of starter cultures
23. Write importance of salt in sauerkraut
24. Write a note on fermented meat – sausages
25. Explain the wine fermentation process
26. Write a note on mushroom production
27. Write a note of FDA regulation
28. Enlist the functions of ISI
29. Explain cheese making process
30. Diagrammatically represent steam blancher and anf write sa note on blanching process.
31. Discuss effect of mechanical drying on food properties

FOR 4 MARKS:

1. Explain the criteria for the selection of starter cultures.
2. Write a note on activity and purity of starter cultures
3. Write importance of salt in sauerkraut
4. What is HACCP & write down its principle
5. What is food adulteration? Describe common adulterants in foods and methods of their detection.
6. Write a note of FDA regulation
7. What is FSSAI? What are objectives & functions performed by FSSAI
8. What is FPO? What are objectives & functions performed by FPO
9. Enlist the functions of ISI
10. What do you mean by food preservation by thermal technologies? Diagrammatically represent steam blanching for food preservation
11. Write importance of salt in sauerkraut
12. Write a note on fermented meat – sausages
13. What is AGMARK? What are the products available under AGMARKS?
14. Write a note on Food Adulteration Act
15. What is BIS? Write functions and activities of BIS.
16. What is MMPO? Write a note on objectives of MMPO
17. What is ISI? Write a note on objectives & functions of ISI?
18. What is HACCP? Write a note on HACCP
19. What is MPO? Write a note on objectives of MPO
20. What is ISI? Write objectives & functions of ISI?
21. What is PFA? Write a note on prevention of Food Adulteration Act
22. Write a note of FDA regulations
23. Explain the criteria for the selection of starter cultures.
24. Write a note on activity and purity of starter cultures
25. Write importance of salt in sauerkraut
26. Discuss legislations of GMP in food

27. Write a note on GMP
28. Write principles of GMP
29. What are benefits of proper implementation of GMP
30. Write a note on building & facility in Good manufacturing practices
31. Discuss microbial safety in GMP
32. Discuss chemical safety in GMP
33. Discuss physical safety in GMP
34. Discuss natural drying process and its limitations
35. Discuss hot air convective drying process and its advantages
36. Discuss mechanism of freeze drying process
37. Discuss mechanism of vacuum drying process
38. Discuss mechanism of fluidized bed drying process
39. Discuss osmotic dehydration process and its limitations
40. Write a note on Codex Alimentarius
41. Why we need to add food additives & discuss some common functions of food additives
42. Write a note on types of food additives
43. Write a note on preservatives as a food additives
44. Explain why use color additives
45. Write a note on flavoring agent as a food additives
46. Give classification of food adultrants
47. Write a note on some common adultrants in milk and desease couused by them
48. Discuss common tests for detection of milk & ghee adultrants
49. Discuss common tests for detection of tea & coffee adultrants
50. Discuss common tests for detection of turmeric & chilli powder adultrants