PH 501.4 Reg. No. | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
Semester IV – P.G. Examination - M.Sc. Biotechnology
May – 2024
FOOD BIOTECHNOLOGY

Time: 3 Hours **Max. Marks: 70**

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary.

I. Write short notes on any FIVE of the following: (5x3=15)

1. What is nutrigenomics? What way it relates to health outcomes in individuals?
2. How would you apply sensory evaluation techniques to assess the quality of a food product?
3. What are the treatment options for food poisoning in humans?
4. What are the biochemical changes associated with food during spoilage?
5. Discuss the role of preservatives in increasing the shelf life of certain food items.
6. Define blanching in the context of food preparation and preservation. Briefly explain the primary purpose of blanching and provide an example of a vegetable commonly blanched before further processing.
7. Elaborate on the role of xanthan gum in food processing, highlighting its applications in enhancing viscosity and stabilizing emulsions.
8. Identify the steps of Swiss cheese production and depict it in a flow chart.

II. Write explanatory notes on any FIVE of the following: (5x5=25)

9. Describe a scenario where compliance with FSSAI regulations is necessary for launching a new food product in India.
10. Discuss the economic motivations behind food adulteration and its impact on consumer trust in the food industry.
11. How to differentiate the spoilage of food by different microbes?
12. Explain toxic effect of bacterial toxins with suitable examples.
13. Describe canning as a preservation technique.
14. Explain the importance of irradiation method for food preservation.
15. Explain the process of cultivation of Spirulina and the factors affecting its growth.
16. Compare and contrast the fermentation processes involved in making miso and tempeh.

III. Answer any THREE of the following: (3x10=30)

17. Evaluate the role of governmental agencies and international organizations in setting and enforcing food grades and standards.
18. Elaborate on the spoilage of milk and milk products by microorganisms.
19. Give a detailed account on the process of pickling and smoking of food.
20. Provide a detailed step-by-step guide to the method of making Beer, emphasizing critical fermentation stages.
21. Provide a comprehensive overview of the different types of food additives and write a note on E-number.

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St Aloysius College (Autonomous)
Mangaluru
Semester IV – P.G. Examination - M.Sc. Biotechnology
May – 2024
MOLECULAR DIAGNOSTICS AND IMMUNOTECHNIQUES

Time: 3 Hours **Max. Marks: 70**

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary.

I. Write short notes on any FIVE of the following: (5x3=15)

1. What are the components of viral transport medium (VTM)?
2. How do biosafety measures differ when handling different types of infectious disease specimens?
3. Define Von Hippel-Lindau Syndrome (VHL). Mention the cause of VHL.
4. Mention the advantages of NGS over other sequencing methods.
5. Write short notes on Comet assay.
6. List out the different types of staining techniques for fixed cells.
7. What do you understand by subunit vaccines?
8. What are polyclonal antibodies?

II. Write explanatory notes on any FIVE of the following: (5x5=25)

9. Discuss the challenges associated with designing and optimizing multiplex PCR assays for respiratory pathogen detection.
10. Evaluate the significance of PCR-based techniques in forensic investigations, highlighting specific examples where STR analysis has been instrumental.
11. Evaluate the comparison between Germline Vs Somatic testing.
12. What is the Philadelphia chromosome and what specific genetic abnormality does it represent?
13. Describe radio immunoassay. Mention its applications.
14. Describe surface plasmon resonance. Add a note on its applications.
15. Discuss the challenges and limitations associated with plasma therapy.
16. Discuss on the transfusion of immunocompetent cells to boost immunity.

III. Answer any THREE of the following: (3x10=30)

17. Evaluate the reliability and accuracy of different DNA markers and genetic loci used in paternity testing and human identification, including mitochondrial DNA (mtDNA) and Y-chromosomal markers.
18. Analyze the role of real-time PCR in early detection and surveillance of H1N1 outbreaks, including its impact on public health response strategies.
19. Anaplastic Lymphoma Kinase (ALK) rearrangement detection with immunohistochemistry (IHC).
20. Explain BRCA 1/2 mutation detection with DNA sequencing.
21. Discuss the various cytokine expression assays.

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PS 506.4 Reg. No. | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
Semester IV – P.G. Examination - M.Sc. Biotechnology
May – 2024
CLINICAL RESEARCH, IPR AND PATENTS

Time: 3 Hours **Max. Marks: 70**

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary.

I. Write short notes on any FIVE of the following: (5x3=15)

1. Define the role and responsibilities of Clinical Research Associates (CRAs) in the conduct of clinical trials.
2. Explain the principles for ensuring data integrity and traceability in GCP.
3. Write a short note on drug development.
4. How is safety margin defined and utilized in the context of pharmacodynamics during preclinical research?
5. Discuss the concept of novelty and its importance in patent applications.
6. Discuss on intellectual property rights.
7. What is a Performer's Right?
8. Describe the primary objectives of preclinical trials.

II. Write explanatory notes on any FIVE of the following: (5x5=25)

9. Provide an overview of clinical research regulations, focusing on the regulatory frameworks established by the US Food and Drug Administration (FDA).
10. Investigate the role of WIPO in supporting innovation and technology transfer among member states.
11. Evaluate the factors influencing the stability of drug formulations, including environmental factors, formulation components, and packaging materials.
12. What are the main criteria for the registration of a new plant variety and how are these criteria evaluated?
13. Explain the concept of dose-response relationships in toxicology studies and their implications for establishing safe dosage levels in humans.
14. Explain the rationale behind the Kefauver Amendments, including the historical context of drug safety scandals that prompted their enactment.
15. Analyze the role of the Patent Cooperation Treaty (PCT) in simplifying the international patent application process.
16. Describe the process for the ethical review and approval of research protocols involving animal experimentation by IAECs under CCSEA guidelines.

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III. Answer any THREE of the following: **(3x10=30)**

17. Discuss the four main processes involved in pharmacokinetics and their significance in drug developmental process.
18. Compare and contrast the different types of clinical research methodologies.
19. Discuss the criteria and requirements for patent eligibility in the US.
20. Discuss the stages involved in grant of a patent. Explain the different types of patent application.
21. Illustrate the steps taken to establish and maintain a robust quality management system in a GLP laboratory for preclinical research.

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