

PH 501.3

Reg. No:

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St Aloysius College (Autonomous)
Mangaluru
Semester III – P.G. Examination - M.Sc. Biotechnology
JANUARY-2021

ANIMAL 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. Cryopreservation
2. Trypsin
3. Cord blood cells
4. Immobilized cell culture system
5. Transient expression
6. Reporter marker
7. IVF
8. Transgene

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

9. Aseptic condition
10. Cytotoxicity tests
11. Organ culture
12. Culture of adult stem cells
13. Expression vectors
14. Gene amplification
15. Gene therapy
16. Physical methods of gene transfer.

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

17. Describe the different types of culture media for animal cells and their ability.
18. Explain in tissue engineering of skin and cartilage.
19. Describe the types, characteristic features and application of stem cells.
20. Describe various methods for animal cloning.
21. What is a cell line? Explain the method of development, maintenance and management of cell lines.

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PLANT 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. Organisation chloroplast genome
2. Gibberellins
3. Meristem culture
4. cryopreservation
5. Rhizobium
6. RAPD
7. Bt-Brinjal
8. Golden rice

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

9. Cytoplasmic male sterility
10. Techniques of callus cultures
11. Somaclonal variation
12. Regulation of gene expression in floral development
13. Nitrogen fixation in legumes by cyanobacteria.
14. ISSR and SCAR
15. Reporter genes
16. Transgenic plants for delayed fruit ripening

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

17. Discuss regulation of gene expression in seed development and seed storage proteins.
18. Give a detailed account on production, regulation and commercial importance of secondary metabolites.
19. Describe gene arrangement and the process of nitrogen fixation in legumes by *nif* and *nod* genes.
20. Discuss about molecular mechanism during plant and bacterial pathogen interactions.
21. Give a detailed account on various selectable markers used in plant transformation.

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INDUSTRIAL 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. Mention factors influencing choice of carbon.
2. What are auxotrophic mutant strains?
3. Mention factor influencing KLa values in fermentation vessel.
4. Anti-foam agents
5. What are the criteria's for ideal fermentor?
6. What are baffles
7. Spray driers
8. Flocculation

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

9. What is del factor? How is it achieved through different heat exchangers?
10. Explain inoculum development.
11. Mention the mechanism involved in super critical fluid extraction. Add a note on its application.
12. Explain various batch filtration techniques.
13. What is membrane filtration? Explain with special reference to cutoff value used in nano & microfiltration
14. Explain neat labelled diagram of Tower fermenter with its application
15. What is aeration? How is it achieved in fermenter vessel?
16. What is fed-batch fermentation ?

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

17. Explain biosensor construction and add a note on its application.
18. Explain various methods used for cell disruption.
19. Discuss methods for isolating industrially important microorganisms.
20. Discuss maintenance of aseptic conditions in fermenter vessel.
21. Discuss production and downstream processing of penicillin.

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ENVIRONMENTAL 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. Commensalism
2. Trickle filters
3. Biomagnification
4. Tropical rain forest
5. MIC
6. Air sparged reactors
7. Contact digesters
8. Degradation of biofilms

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

9. Explain the components of atmosphere.
10. Write a note on anaerobic biological treatment of liquid waste.
11. Define microbial mining. Explain copper biomining.
12. Write a note on pollution indicator organisms.
13. Illustrate an ecosystem with reference to mangroves.
14. Explain the types and treatment methods of biofouling.
15. Give an account on the microbial degradation of pesticides.
16. Discuss on any two keystone species.

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

17. Describe the methods involved in biodiversity conservation.
18. Elaborate on the Nitrogen cycle.
19. Write the principles of microbial bioremediation.
20. Explain the different aerobic biological systems for the treatment of liquid wastes.
21. Discuss the sources, effects and control measures of water pollution.
