PH 501.3

Reg. No: | | | | | | |

St Aloysius College (Autonomous)
Mangaluru

Semester III – P.G. Examination - M.Sc. Biotechnology

November - 2019

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. Cell lines
2. Trypan blue test
3. Scaffolds
4. Bioreactors
5. Stable expression
6. Biochemical markers
7. Biosafety cabinet
8. Gene silencing

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

9. Types of culture media
10. Primary culture
11. Embryonic stem cells
12. Somatic cell fusion
13. Transcriptional control elements
14. Reporter markers
15. IVF
16. Gene therapy

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

17. Describe the design of animal cell culture laboratory with a note on maintenance of sterile conditions.
18. Describe the technique employed for the large-scale culturing of monolayer cells with a note on downstream processing.
19. Write an essay on role of animal cell culture in production of biopharmaceuticals.
20. Elaborate on the production and application of transgenic animals.
21. Describe the salient features and types of cloning vectors.

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St Aloysius College (Autonomous)
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Semester III – P.G. Examination - M.Sc. Biotechnology
November - 2019

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. Atmosphere
2. Tropical rain forest
3. Mercury cycle – schematic representation
4. Structure of biofilms
5. Desert ecosystem
6. Packed column reactors
7. Biomagnification
8. Ocean ecosystem

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

9. Microbial degradation of pesticides
10. Indicator organisms
11. Types of biofouling
12. Copper biomining
13. Mangrove forest
14. Types of interspecific interactions
15. Food chain and energy flow in ecosystem
16. *Exsitu* conservation of biodiversity

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

17. Write an essay on water pollution and control.
18. Define bioremediation. Explain the principles of microbial bioremediation.
19. What is liquid waste? Explain aerobic biological treatment methods of liquid waste.
20. Give a detailed account on Nitrogen cycle.
21. Describe microbial influenced corrosion and remedies.

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St Aloysius College (Autonomous)
Mangaluru

Semester III – P.G. Examination - M.Sc. Biotechnology
November - 2019

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. Seed storage proteins
2. Cytokinins
3. Anther culture
4. Callus culture
5. Nif and nod genes
6. ISSR
7. Bt- Cotton
8. Golden rice

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

9. Organisation of Chloroplast genome.
10. Regulation of gene expression in seed development
11. Micropropagation
12. Secondary metabolite production.
13. Plant- fungal pathogen interactions
14. Marker-assisted selection by QTL in plants.
15. Selectable markers
16. Comment on various strategies for the development of transgenic plants for virus resistance.

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

17. Discuss mitochondrial genome and their interaction with nuclear genome.
18. Give a detailed note on germplasm conservation and its application.
19. Discuss biotic and abiotic factors involved in stress pathways.
20. Explain the development of transgenic plants for bacterial and fungal resistance.
21. Give an account of protoplast culture and somatic hybridization.

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St Aloysius College (Autonomous)
Mangaluru
Semester III – P.G. Examination - M.Sc. Biotechnology
November - 2019
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. Heat exchangers.
2. Aseptic Sampling Method.
3. Foam Separation.
4. Super critical fluid extraction.
5. Continuous sterilization.
6. Production of riboflavin.
7. Antifoaming agents
8. Ultrafiltration.

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

9. List out all the key points while designing and constructing fermentor for microbial and animal cell culture.
10. Write explanatory notes on Filter Sterilization.
11. Explain air lift fermentors.
12. Comment on commonly used nitrogen sources in the medium.
13. Write explanatory notes on development of inocula.
14. Give an account on liquid liquid extraction.
15. Write explanatory notes on various continuous filteration methods.
16. Describe various methods for drying the products.

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

17. Explain Basket and Bowl Centrifugation method.
18. Describe Penicillin production and purification.
19. Explain the construction and applications of biosensors.
20. Describe use of rDNA technology for the improvement of industrial microorganisms.
21. Compare and explain Batch and continuous culture in industrial process.

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St Aloysius College (Autonomous)

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Semester III– P.G. Examination – M. Sc. Biotechnology

November - 2018

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. FACS
2. Cryocans
3. SUZI
4. Stem cells
5. Cell synchronization
6. GFP
7. Electroporation
8. Biopharming

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

9. Cryoprotectants
10. Cell banking
11. Stirred tank reactor
12. Somatic cell fusion
13. Therapeutic enzymes produced by mammalian cell culture
14. Reporter genes
15. Gene knock out
16. Transgenic fish

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

17. Comment on the various methods available for assessing cell viability and cytotoxicity.
18. What is tissue engineering? Explain in detail.
19. Comment on the analysis of gene expression in cell culture.
20. What is ART? Elaborate on the various techniques employed.
21. How do you detect contamination in animal cell cultures? Add a note on its eradication.

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Semester III– P.G. Examination – M. Sc. Biotechnology

November - 2018

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. Cytokinins
2. Cytoplasmic male sterility
3. *In vitro* and *ex vitro* rooting
4. Somaclonal variation
5. Marker assisted selection by QTL in plants
6. Molecular mechanisms of nematode-plant interactions
7. Cholesterol oxidase
8. Stress resistant/tolerant plants

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

9. Seed development and seed storage proteins
10. Abscissic acid and Gibberellins
11. Plant tissue culture media
12. Synthetic seeds
13. Computational tools and resources in plant genome informatics
14. Gene rearrangement and nitrogen fixation in cyanophytes
15. Delayed fruit ripening
16. Antifungal proteins

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

17. Discuss on development of transgenic plants against viruses
18. Explain nitrogen fixation in legumes by *Rhizobium*
19. Describe protoplast culture
20. Give an account on mitochondrial genome organization in plants
21. Discuss on cryopreservation

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Semester III – P.G. Examination – M. Sc. Biotechnology

November - 2018

INDUSTRIAL BIOTECHNOLOGY

Time: 3 hrs. **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. Strategies for isolating antibiotic producers
2. Steam traps
3. Foam separation
4. Meeting " dissolved oxygen" requirement of microbes in the fermentor
5. Fed-batch fermentation
6. Control of pH in the bioreactor
7. Steam sterilization of the media
8. Continuous filtration

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

9. Air lift fermentor
10. Aseptic sampling
11. Use of recombination systems for heterologous protein production.
12. Impellers used in fermentors
13. Physical methods of cell disruption
14. Ultra filtration
15. Strategies of prevention of foaming
16. Penicillin production

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

17. Discuss the design strategies of fermentation media.
18. Give an account of design of a typical fermentor.
19. Give an account of common methods used to monitor typical process variables.
20. Explain various techniques employed for product enrichment from broth.
21. Application of membrane processes for the purification of products from broth.

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Semester III– P.G. Examination – M. Sc. Biotechnology

November - 2018

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. Acid rain
2. Energy flow
3. Coral reefs
4. Mercury cycle
5. Bioaccumulation
6. Keystone species
7. Packed column reactors
8. Pesticides

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

9. Atmosphere
10. Soil pollution and control measures
11. Types of biodiversity
12. Microbial mining
13. Taiga and Tundra forest
14. Aerobic treatment of liquid wastes
15. *In situ* bioremediation
16. Types of biofouling

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

17. Explain the causes and preventive measures for air pollution.
18. Explain the role of various indicator organisms in environmental monitoring.
19. Explain various approaches for biodiversity conservation.
20. Explain in detail nitrogen cycle.
21. Describe the process of microbial degradation of hydrocarbons.

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19. Discuss type II hyper sensitivity.

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Semester III– P.G. Examination – M. Sc. Biotechnology
November - 2017

ANIMAL BIOTECHNOLOGY

Time: 3 Hours

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

Max. Marks: 70

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

1. MTT assay
2. Cell lines
3. Lac Z
4. Suspension culture
5. Transient expression
6. Selection marker
7. Animal cloning
8. Transgene

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

9. Essential equipment for cell culture
10. Primary culture
11. MAbs and its application
12. Organ culture
13. Reporter marker
14. Expression vector
15. Gene therapy
16. IVF

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

17. Give an account of various culture media used for culturing animal cells
18. Describe stem cells and give an account on maintenance of mouse embryonic stem cells and their applications.
19. Write an essay on role of animal cell culture in production of biopharmaceuticals
20. Describe the methods of production of transgenic animals.
21. Discuss on different types of cloning vectors used for heterogeneous expression in animal cells.

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St Aloysius College (Autonomous)
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Semester III– P.G. Examination – M. Sc. Biotechnology
November - 2017

PLANT BIOTECHNOLOGY

Time: 3 Hours

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

Max. Marks: 70

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

1. Significance of male sterility in plants
2. RNA editing
3. Meristem culture
4. Plant tissue culture history
5. *Nif* and *nod* genes
6. SNP
7. Golden rice
8. Proteinase inhibitor

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

9. Organization of chloroplast genome
10. Regulation of gene expression in floral development
11. Somatic embryogenesis
12. Cell suspension culture
13. Molecular mechanism of fungi-plant interactions
14. Biotic and abiotic factors involved in stress tolerance
15. *Bt* brinjal
16. Herbicide tolerant plants with respect to phosphinothricin

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

17. Explain in detail the development of transgenic plants against fungi
18. Discuss on RAPD, AFLP and ISSR markers
19. Describe bioreactor technology and secondary metabolite production
20. Explain various plant hormones used in tissue culture
21. Give an account on embryo culture and embryo rescue.

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Semester III– P.G. Examination – M. Sc. Biotechnology

November - 2017

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. Penicillin
2. Packed tower
3. Antifoam
4. Auxotrophic mutants
5. Reverse osmosis
6. Heat exchanger
7. Basket centrifuge
8. Agitation

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

9. PID control
10. Analogue resistant mutant
11. Steam traps
12. Ultra-filtration
13. Principles of freeze drying
14. Airlift fermentor
15. Foam separator
16. Cell lysis methods

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

17. Explain the design and working principles of a rotating disc fermentor. Add a note on its disadvantages.
18. How is citric acid produced at industrial scale?
19. Describe a glucose biosensor. What is its importance in fermentation industry?
20. Describe the methods of preserving industrially important microorganisms. Which are the major culture collection centres of our country?
21. Explain super critical fluid extraction. Add a note on its disadvantages.

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St Aloysius College (Autonomous)

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Semester III– P.G. Examination – M. Sc. Biotechnology

November - 2017

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. Lotic aquatic system
2. Biomes
3. Keystone species
4. Biomagnification
5. Biofilms
6. Trickling filters
7. Hydrocarbons
8. Liquid wastes

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

9. Structure of atmosphere
10. Mangrove vegetation
11. Microbial influenced corrosion
12. Carbon cycle
13. Microbial degradation of pesticides
14. Anaerobic treatment of liquid wastes
15. Sulphur cycle
16. Tropical rain forest and Desert ecosystem

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

17. Describe food chain, food web and energy flow with suitable examples.
18. Write an essay on biodiversity conservation.
19. Define biofouling. Explain their types and treatment methods.
20. Explain the principles of microbial bioremediation
21. Write a note on water pollution and control.

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