SECOND YEAR

GENERAL MICROBIOLOGY

CULTURE METHODS

ESSAY

1. Classify culture methods. Describe in detail about aerobic culture methods of bacteria
   - What are culture methods
   - Its uses
   - Classify and explain aerobic methods with neat diagrams

2. Anaerobic culture methods .explain about Mcinthoshfildes jar
   - Uses of anaerobic method
   - List out the different anaerobic methods
   - Explain Mcinthosh jar with diagram

SHORT ESSAY

1. Streak culture / Surface plating
   - Procedure
   - Uses
   - Diagram

2. Stroke / Slope /Slant culture
   - Procedure
   - Uses
   - Diagram

3. Stab culture
   - Procedure
   - Uses
   - Diagram
   - Advantages ,disadvantages

4. Lawn / Carpet culture
   - Procedure
   - Uses
   - Diagram
   - Advantages ,disadvantages

5. Pour Plate culture
   - Procedure
   - Uses
   - Diagram

6. Liquid cultures
   - Procedure
   - Uses
   - Diagram

7. Mcinthoshfildes jar
   - Principle
   - Procedure
   - Uses
   - Diagram

8. Gas pack
   - Procedure
   - Uses
   - Diagram

9. Glove box
   - Procedure
   - Uses
   - Diagram

10. Standardisation of bacterial loop
11. Colony morphology on solid media

BACTERIOPHAGE

ESSAY

1. What are Bacteriphage. Explain lytic cycle
   - Definition
   - Classification
   - Uses of bacteriophage
   - Explain lytic cycle with neat diagram

2. What are Bacteriphage. Explain lysogenc cycle.
   - Definition
   - Classification
   - Uses of bacteriophage
   - Explain lysogenic cycle with neat diagram

SHORT ESSAY

1. Lytic cycle of bacteriophage
   - Bacteriophage-definition
   - Explain cycle with diagram

2. Lysogenic cycle of bacteriophage
   - Bacteriophage-definition
   - Explain cycle with diagram

3. Bacteriophage typing

SHORT NOTES

1. Bacteriophage
2. Bacteriophage tying
3. Bacteriocin

1. IDENTIFICATION OF BACTERIA

ESSAY

1. Enumerate the tests used for the detection of bacterial enzymes. Explain any two
   - Catalase
   - Oxidase
   - Coagulase
   - Principle procedure and positive and negative quality control

SHORT ESSAY

1. Tests for metabolism of carbohydrate
   - List out the tests
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

2. Tests for metabolism of aminoacid and protein
   - List out the tests
   - Principle, media, reagents, interpretation, quality control)

3. Tests for metabolism of fat
   - List out the tests
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

4. Tests for metabolism of enzymes
   - List out the tests
   - Principle
   - Media
   - reagents, interpretation, quality control

5. IMViC
   - List out the tests
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

6. Indole test
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

7. MR test
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

8. VP test
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

9. Citrate test
   - Principle
   - Media
   - Reagents
   - Interpretation
   - Quality control

10. OF test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

11. TSI test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

12. PPA test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

13. Gelatine liquefaction
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

14. Catalase test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

15. Oxidase test

- Principle
- Media
- Reagents
- Interpretation
- Quality control

16. Urease test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

17. Nitrate test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

18. Coagulase test
    - Principle
    - Media
    - Reagents
    - Interpretation
    - Quality control

SHORT NOTES (refer short essay)

1. Streak culture
2. Stroke culture
3. Stab culture
4. Lawn culture
5. Pour plate culture
6. Liquid culture

7. Mcinthosh jar
8. RCM
9. Gas pack
10. Glove box
11. IMViC
12. MR
13. VP
14. Indole
15. Citrate
16. + PH adjustments
17. OF
18. Solidifying agents used in culture media
19. TSI
20. PPA
21. Gelatin liquefaction
22. Catalase test
23. Urease test
24. Oxidase test
25. Nitrate test
26. Rapid identification tests
    (what are rapid tests, advantages, explain each test)
27. Lysine iron agar
28. Bacterial loop
29. Mesophilic bacteria
30. Deionised water
31. Inbred mice
32. Detection of hydrogen sulfide

Mc FARLAND STANDARD

SHORT ESSAY /SHORT NOTES

1. McFarland standard
   - Contents
   - Preparation
   - use interpretation
   - Mcfarland opacity tube
   - Simple opacity standards

MUTATION

ESSAY

1. Define mutation. Describe types of mutation. Write a note on mutagens.

SHORT ESSAY

1. Mutation
   - Definition
   - Types
   - Explain each type with example)
2. Mutagens
   - Definition
   - Types
   - Explain each type with example
3. Ame's test
   - Principle
   - Procedure
   - Interpretation
   - Uses with diagram
4. Replica plating

- Principle
- Procedure
- Interpretation
- uses with diagram

SHORT NOTES

1. Mutation
2. Mutagens
3. Ame's test
4. Replica plating

MICROBIAL GROWTH & NUTRIENTS FOR MICROBIAL GROWTH

ESSAY

1. Explain the physical conditions required for bacterial growth
   - Explain oxygen,pressure,light,co_2,moisture,osmotic stress etc

2. Classification of culture media with examples .Explain detail about special media
   - Classify and explain ,

3. Special media ; Enriched media
   - Enrichment media
   - Selective media
   - Differential media
   - Indicator media
   - Transport media
   - Sugar media

4. Enumerate anaerobic culture media and explain anaerobic medias
   - At least any two anaerobic culture media
   - RCM /Thioglycollate broth
   - Explain detail contents
   - Method of preparation
   - Method of sterilization
   - Characteristic observation of growth

5. Colony morphology on plated media
   - Size
   - Shape
   - Surface
   - Elevation
   - Edge
   - Opacity
   - Colour
   - Consistancy

SHORT ESSAY

1. Bacterial growth curve
   - Diagram
   - Phases
   - Lag phase
   - Log phase
   - Stationary phase
   - Decline phase-another names
   - Total count growth curve
   - Viable count
   - Growth curve

2. Continuous culture
   - Chemostat
   - Turbidostat
   - working principle
   - Diagram

3. Adanssonian classification
   - Mention numerical taxonomy, explain

4. Common ingredients of culture media
   - Peptone
   - Meat extract

- agar
- Buffers
- pH
- Indicators
- Sugars etc explain

5. Enriched media
   - Define enriched media

6. Blood agar
   - Explain content preparation uses sterilization method observation of growth

7. chocolate agar
   - Explain content preparation uses sterilization method observation of growth

8. Selective media
   - Define selective media
   - Explain with examples such as DC, TCBSA, LJ etc

9. Differential media
   - Define with examples, MA CLED etc

10. Transport media
    - Define with examples explain

11. Anaerobic media
    - Define with examples explain

12. pH adjustments of culture media
    - Different methods,
    - Conversion of acidic to alkaline and vise versa

13. LJ media
    - Ingredient functions uses
    - Method of sterilization

14. Tellurite blood agar
    - Contents

- Preparation
- Colony morphology

15. 15. Alkaline peptone water
    - Contents
    - Preparation
    - Uses

16. TCBS
    - Ingredient functions uses
    - method of sterilization

17. QC in media preparation
    - Media keeping
    - Performance test

18. Liquid media
    - Definition
    - Uses
    - Advantage
    - Disadvantage
    - Examples

19. Solid media
    - Definition
    - Uses
    - Advantage
    - Disadvantage
    - Examples

20. MacFarland standard
    - Preparation
    - uses

SHORT NOTES

1. Growth curve
2. MacConkey agar
3. Total nitrogen concentration
4. RCM
5. Anaerobic media
6. pH adjustments of culture media
7. LJ media
8. TCBS
9. QC in media preparation
10. Liquid media
11. Solid media
12. MacFarland standard
13. Continuous culture
14. Adanssonian classification
15. Common ingredients of culture media
16. Enriched media
17. Selective media
18. Differential media
19. Transport media
20. Preparation of andrades indicator
21. Name 3 pH indicatorsand their pH range
22. Agar-agar
23. Sterilizatuin of culture media
24. Methyl red test
25. QC of MA medium
26. Lablemco
27. Cary Blair medium

BACTERIAL GENETICS

1. Classification of gene transfer method and explain detail about any one method
   - Lateral gene transfer
   - Horizontal gene transfer – Transformation
   - Transduction
   - Conjugation
   - Explain any one

2. Definition of gene transfer and explain conjugation with a neat labelled diagram
3. Name various drug resistant mechanism in bacteria. Describe in detail the plasmid mediated drug resistance with example

SHORT ESSAY

1. Transformation
   - Griffith experiment applications

2. Conjugation
   - F^+ x F^- , F^+ X F', HFRxF'

3. Transduction
   - Generalized transduction and specialized transduction

4. Plasmids
   - Diagram
   - Explain detail

5. Transposons
   - Diagram
   - Jumping genes
   - Working

6. Operon
   - Repression
   - Induction
   - Diagram
   - Regulation

SHORT NOTE

1. Plasmids
2. Lac Operon
3. Trp Operon
4. Transposons
5. Genotypic and Phenotypic variation
6. R factor

CARE AND MANAGEMENT OF LABORATORY ANIMALS

ESSAY

1. List out laboratory animals and explain feeding ,housing ,breeding any one of it
   - Rat
   - Rabbit
   - Mouse
   - Guinea Pig
   - Transgenic mouse

2. Handling and care of rat
   - Different type of handling
   - Cage
   - Food
   - Accommodation

3. Explain different route of inoculation in lab animals
   - Scarification
   - Subcutaneous
   - IV
   - IP
   - IM
   - IC
   - Intra Nasal

4. Explain animal house
   - Schematic diagram of an animal house
   - Different rooms such as –reception room
   - Quarantine room
   - Store room
   - Breeding room
   - Record keeping room etc..
   - Cages
   - Food and water supply
   - Disease out break in animal house

5. Collection of blood from mouse
   - Handling of mouse
   - Different routes
   - Procedure

6. Germ free animals
   - Definition
   - Features
   - Application

SHORT ESSAY

1. Animal cage
   - Detail about animal cage
   - Structure
   - Food and water supply
   - Features

2. Maintenance of animal house
   - Bedding
   - Water supply
   - Food
   - Labelling of cages
   - Routine cleaning of cages

3. Gnotobiotic animals
   - Germ free animals
   - Growing
   - Uses
   - Examples
   - Application

4. Diseaseout break in the animal house
   - Source
   - Quarantine
   - Signs of disease ,
   - Difference between healthy animals and diseased animals –mention any four differences

5. Anesthesia for lab animals
   - List out and explain injectable anesthetic agents
   - Inhalant and local anesthetics

6. Euthanasia
   - Definition
   - Physical Methods –Stunning, Cervical dislocation, Decapitation, Shooting , Electroduction
   - Chemical methods –Ether, Carbon dioxide, Barbiturates, Saturated $MgSO_4$ or KCl_2,CO

SHORT NOTE

1. Maintenance of animal house
2. Postmortem examination of lab animals , Killing and disposal
3. Guinea pig
4. Rabbit
5. Mouse
6. Rat
7. Healthy hazards in the animal house
8. Anesthesia

9. Euthanasia
10. Physical features of animal house
11. Animal cages
12. Gnotobiotic animals
13. Disposal of dead animals
14. Infant suckling mouse