

# **Bajaj College of Science, Wardha**

## **Practice Sheet During Lockdown**

### **M.Sc Sem- II**

#### **Subject: Microbiology**

#### **Paper-V: Methods for Environment Management (MMEM) (MB2-T005)**

#### **Long Questions (16 Marks)**

1. Define Biodeterioration. Discuss in detail biodeterioration of woods and pharmaceutical products.
2. What is Eutrophication? Discuss in detail on microbial changes induced by organic and inorganic pollutants in eutrophication.
3. Write concept of Biomagnification. Add a detailed note on Biomagnification of chlorinated hydrocarbons
4. Explain in detail Biomagnification of pesticides
5. Discuss in detail Biotransformation of metals and metalloids.
6. Explain Bioleaching of a copper.
7. Explain in detail how plastics can be degraded biologically.
8. Give detail account on concept and types of Bioremediation
9. Describe waste water management using Rotary Biological Contractors with suitable diagram.
10. Explain the role of Aerated lagoon and trickling filter in waste water management process.
11. Explain in detail Acid mine Drainage and associated problems.
12. Explain concept of Ozone depletion and factors influence on it.

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### **Short Questions (8 Marks)**

1. Add detail note on concept and consequences of Biomagnification .
2. Discuss on microbial changes induced by organic pollutants in eutrophication.
3. Explain concept of Bioremediation with its applications.
4. Explain in detail bioleaching of uranium
5. Explain concept of Activated sludge in waste water management process.
6. Write a note on Global warming
7. Explain about climate change
8. Discuss in detail about trickling filter
9. Explain in detail about stabilization ponds
10. Discuss different types of global environmental problems
11. Explain Biomarker genes & Bioreporter genes
12. Give detail note on Acid rain
13. Discuss different applications of bioleaching
14. Explain in detail biotransformation of mercury

### **Shortest Questions (4 Marks)**

1. Biodeterioration of woods by fungus.
2. Eutrophication.
3. Biomagnification process.
4. Mercury transformation.
5. Applications of Bioleaching.
6. Bioreporter genes.
7. Applications of Bioremediation.

8. Fluidized bed reactor.
9. Significance of waste water treatment process.
10. Stabilization pond.
11. Greenhouse effect.
12. UV-B light.
13. Ozone depletion.
14. Global warming.

## **Paper-VI: Microbial Metabolites (MMT) (MB2-T006)**

### **Long Questions (16 Marks)**

1. What are Polyamines? Explain the synthesis of Codaverine and Putrescine
2. What are secondary metabolites? Discuss in detail structure and mode of action of different secondary metabolites
3. Give detail account on plant secondary metabolites
4. Discuss in detail about aflatoxin, ochratoxin and patulin
5. Explain in detail structure and function of different types of microbial biopolymers
6. Give detail account on concept of antibiotics and comment on history and discovery of antibiotics
7. Discuss in detail the mechanism of antibiotic resistance
8. Give the structure and mode of action of Tetracycline and Chloramphenicol
9. Give the structure and mode of action of Aminoglycosides and carbapenems
10. Describe the structure and function of Haemoglobin and Myoglobin.
11. Give detail account on Melanin and bile pigments.
12. Discuss in detail Bacteriochlorophylls.
13. Give detail account of structure and function of rhodopsin
14. Explain in detail structure, function and chemistry of Retinol (Vitamin A)
15. Discuss in detail structure, function and chemistry of Riboflavin (Vitamin B2)
16. Give detail account on any four types of vitamin deficiency diseases

### **Short Questions (8 Marks)**

1. Discuss in detail structure and mechanism of action of Digitoxin
2. Explain in detail about Salicylic acid

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3. Discuss in detail about Chitin and Xanthan
4. Discuss in detail about:
  - a) Hyaluronic acid
  - b) Spermidine
5. Explain structure and functions of Sulphonamides
6. Explain structure and function of fucanazole and Nitrofurantoin
7. Explain mode of action of Penicillin
8. Explain mode of action of Quinolones
9. Explain mode of action of Chloramphenicol
10. Write note on following accessory pigments:
  - a) Pulcherrimin
  - b) Indigoidin.
11. Give structure and function of carotenoids
12. Write note on the following:
  - a) Characteristics of fat soluble vitamins
  - b) Scurvy
13. Write note on the following:
  - a) Pernicious anemia
  - b) Osteoporosis
14. Explain in detail about mycotoxins
15. Discuss about Keratomalacia and Osteomalacia

**Shortest Questions (4 Marks)**

1. Explain in brief secondary metabolites
2. Pullulan
3. Functions of Polyamines
4. Mycotoxins
5. Give the mode of action of Quinolones

6. Mechanism of antibiotic resistance
7. Give mode of action of Macrolides
8. Explain structure and mode of action of Fluconazole
9. Discuss Rhodopsin
10. Defensive role of pigments
11. Give structure and function of Myoglobin
12. Carotenoids of prokaryotes
13. Give the structure of Cyanocobalamin
14. Xerophthalmia
15. Osteomalacia
16. BeriBeri

## Paper-VII: Medical Microbiology and Parasitology (MMP) (MB2-T007)

### Long Questions (16 Marks)

1. Give detail account on types and stages of infection
2. Discuss the mechanism of adhesion, colonization and invasion of mucous membranes of respiratory and enteric tracts.
3. Explain the mechanism bacterial adhesion, colonization and invasion of urogenital tract.
4. Discuss pathogenesis and laboratory diagnosis of *Klebsiella pneumoniae*
5. Discuss pathogenesis and laboratory diagnosis of *Shigella dysenteriae*
6. Discuss pathogenesis and laboratory diagnosis of *Pseudomonas aeruginosa*
7. Discuss pathogenesis and laboratory diagnosis of *Streptococcus pneumoniae*
8. Describe morphological characteristics and laboratory diagnosis of *Vibrio cholerae*.
9. Describe the pathogenesis and laboratory diagnosis of *Salmonella typhi*.
10. Discuss the pathogenesis and laboratory *Candida albicans*.
11. Discuss in detail morphological characteristics and pathogenesis of *Microsporium*
13. Discuss in detail morphological characteristics, pathogenesis and laboratory diagnosis of *Trichophyton*
14. Discuss in detail morphological characteristics and pathogenesis of *Hymenolepis nana*.
15. Discuss in detail Multi drug resistant tuberculosis.
16. Describe in detail Methicillin resistant *Staphylococcus aureus*.

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### Short Questions (8 Marks)

1. Explain in detail morphology and pathogenesis of *proteus vulgaris*
2. Discuss on Laboratory diagnosis of *Shigella dysenteriae*
3. Elaborate in detail Pathogenesis of *E. histolytica*
4. Discuss on morphology and Laboratory diagnosis of *Taenia solium*.
5. Explain in detail morphology and pathogenesis of *Clostridium difficile*
6. Explain pathogenesis and laboratory diagnosis of *Bordetella pertussis*
7. Discuss on new emerging infections
8. Explain about *Candida albicans*
9. Write detail note on *Cryptococcus neoformans*
10. Explain the pathogenesis of *Pneumocystis carinii*
11. Explain in detail about pathogenesis of *Blastomyces dermatitidis*
12. Discuss in detail about *Giardia Lamblia*
13. Describe in detail about pathogenesis and laboratory diagnosis of *Plasmodium vivax*
14. Explain in detail about *Taenia saginata*
15. Discuss on *Schistosoma haematobium*

### Shortest questions (4 marks)

Write a note on the followings:

1. Toxins
2. Types of Infection
3. Aggressins
4. Pathogenesis of *Clostridium perfringes*

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5. Rapid methods for laboratory diagnosis of *Streptococcus pneumoniae*
6. Pathogenesis of *Leishmania donovani*
7. Laboratory diagnosis of *Blastomyces dermatidis*
8. *Streptococcus suis*
9. Laboratory diagnosis of *Bordetella pertussis*.
10. Laboratory diagnosis of *Clostridium difficile*.
11. *Giardia Lamblia*
12. *Microsporium*
13. *Trichophyton*

## **Paper-VIII: Immunology and Immunodiagnostics (IID) (MB2-T008)**

### **Long Questions (16 Marks)**

1. What is complement? Discuss the classical and alternate pathways of complement activation.
2. Discuss T-cell dependent and T-cell independent defense mechanism.
3. Discuss in detail Lymphoid organs.
4. Write in detail Mannose binding Lectin pathway of complement activation. Give a note on functions of protectin.
5. Describe in detail pathways of antigen processing and presentation.
6. Explain the mechanism of Graft rejection. Add note on immunosuppressive therapy.
7. Discuss in detail Cancer immunotherapy
8. What is immunological tolerance? Write the mechanism of central and peripheral tolerance to self antigen.
9. Discuss in detail type I and type II hypersensitivity.
10. Give detail account on SCID (Severe Combined Immunodeficiency Disorder)
11. Discuss in detail ELISA as a technique for Immuno diagnosis.
12. What is agglutination? Discuss haem agglutination, passive agglutination, reverse passive agglutination and agglutination inhibition reaction.
13. Discuss in detail Immunoelectron microscopy as a technique for Immuno diagnosis.

### **Short Questions (8 Marks)**

1. Discuss in detail mechanism of central and peripheral tolerance
2. Explain in detail about Systemic Lupus Erythematosus

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3. Write in detail about Multiple sclerosis
4. Discuss in brief about Type III Hypersensitivity
5. Discuss in detail about Grave's disease.
6. Explain in detail Western Blotting technique
7. Explain in detail about Radioimmunoassay
8. Write detail note on immunodiffusion
9. Explain in detail about Type IV hypersensitivity
10. Discuss in detail about Rheumatoid arthritis
11. Explain in detail about Immunosuppressive therapy
12. Discuss in detail about Complement fixation test.
13. Describe in detail Goodpasture syndrome
14. Discuss about Reverse passive agglutination
15. Explain in detail about agglutination inhibition

### **Shortest questions (4 Marks)**

Write a note on following

1. Antibody class switching.
2. Natural killer cells.
3. Lymphocytes
4. Oncogenes.
5. Tumor Antigens.
6. Immune surveillance theory.
7. DiGeorge Syndrome.
8. T-cell deficiency syndrome.

9. Pernicious anaemia.
10. Multiple sclerosis.
11. Immunofluorescence
12. Immuno electrophoresis
13. Immuno electron microscopy
14. agglutination inhibition test
15. Precipitation

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