THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0524] **MAY 2024** **Sub. Code: 4012**

M.D. DEGREE EXAMINATION

BRANCH IV – MICROBIOLOGY

PAPER IV – APPLIED MICROBIOLOGY AND RECENT ADVANCES

Q.P. Code: 204012

Time: Three Hours **Maximum: 100 Marks**

I. Essay: **(2 x 15 = 30)**

1. a) Enumerate the commonly encountered health care associated infections (HAI) and their causative agents.
   b) Discuss about the care bundle approach for prevention of device – associated infections.
   c) Add a note on the HAI surveillance.

2. a) Discuss the methods of determining the antimicrobial resistance (AMR) of bacteria.
   b) Write a note on the rapid molecular antimicrobial resistance detection methods.
   c) Add a note on the objectives of celebrating World AMR awareness week.

II. Short notes: **(10 x 5 = 50)**

1. Newer Vaccine Delivery System.
2. Emerging viral infections in India.
3. Point of care testing in Microbiology.
4. Fungal Rhinosinusitis.
5. Matrix Assisted Laser Desorption / Ionization time of flight mass spectrometry (MALDI –TOF).
6. Biosafety in Microbiology lab.
7. Probiotics.
8. Microbiological surveillance of Operation theatre.
9. Nososcomial parasitic infections.
10. One health approach.

III. Reasoning Out: **(4 x 5 = 20)**

1. Capsule of Cryptococcus neoformans is a virulence factor.
2. An indwelling catheter is a risk factor for developing urinary tract infection.
3. The development of a candidate HIV vaccine is still a challenge.
4. Levy-Jennings chart is laboratory quality control applications.

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THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 1224] DECEMBER 2024 Sub. Code: 4012

(OCTOBER 2024 EXAM SESSION)

M.D. DEGREE EXAMINATION

MICROBIOLOGY

PAPER IV – APPLIED MICROBIOLOGY AND RECENT ADVANCES

Q.P. Code: 204012

Time: Three Hours **Maximum: 100 Marks**

I. Essay: **(2 x 15 = 30)**

1. Define Antimicrobial stewardship. What are the components of antimicrobial stewardship. Add a note on SAAR – Standard Antimicrobial Administration Ratio.

2. Enumerate types of DNA sequencing. Write in detail about principle and steps in Next Generation Sequencing (NGS) and add a note on its clinical applications.

II. Short notes: **(10 x 5 = 50)**

1. Emerging and re-emerging infection.
2. Hospital Infection Control committee.
3. National viral hepatitis control programme.
4. Cather Related Blood Stream Infections (CRBSI).
5. World Antibiotic Awareness Week.
6. Mycobacterial Growth Indicator Tube (MGIT).
7. Molecular docking.
8. Macromolecule blotting and probes.
9. Line Probe Assay (LPA) and its application in Tuberculosis investigations.
10. Rapid Sepsis diagnosis.

III. Reasoning Out: **(4 x 5 = 20)**

1. Ionizing radiation has more advantages than non-ionizing radiation.
2. Lysis centrifugation is a preferred blood culture technique.
3. Utility of Mc Crady probability table.
4. Biosafety level is determined based on pathogens.

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THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0525] **MAY 2025** **Sub. Code: 4012**

M.D. DEGREE EXAMINATION

MICROBIOLOGY

PAPER IV – APPLIED MICROBIOLOGY AND RECENT ADVANCES

Q.P. Code: 204012

Time: Three Hours **Maximum: 100 Marks**

I. Essay: **(2 x 15 = 30)**

1. Discuss the recent advances in molecular diagnostic techniques. Add a note on CRISPR-Cas 9 and genome editing.

2. Explain in detail about the handling epidemic outbreak of Vibrio cholera in small village having population of 5000.

II. Short notes: **(10 x 5 = 50)**

1. Significant bacteriuria.
2. Pathogenic island.
3. NABL standards and Quality Control in Microbiology.
4. Gut microbiome.
5. Point of care test in Microbiology.
6. BACTEC and VITEK 2.
7. Plasma pyrolysis.
8. Problems in diagnosis of Hepatitis B mutant.
9. Amp 'C' – β lactamases in GNB.
10. Vaccines for adults.

III. Reasoning Out: **(4 x 5 = 20)**

1. Standard suspension of insoluble barium sulphate precipitates has been described by Mc Farland.
2. Though one or two doses of OPV has produced 90-100% seroconversion in advanced countries but not so in developing countries in the tropics.
3. What is the role of restriction endonucleases in molecular genetics?
4. Uni directional workflow is a must in molecular laboratories.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[MD 1025] **OCTOBER 2025** **Sub. Code: 4012**

M.D. DEGREE EXAMINATION

MICROBIOLOGY

PAPER IV – APPLIED MICROBIOLOGY AND RECENT ADVANCES

Q.P. Code: 204012

Time: Three Hours **Maximum: 100 Marks**

I. Essay: **(2 x 15 = 30)**

1. Write in detail about Laboratory Automation in Microbiology and add a note on Quality Assurance.

2. Discuss in detail about the recent molecular diagnostic method in Tuberculosis.

II. Short notes: **(10 x 5 = 50)**

1. Significance Bacteriuria.
2. Plasma sterilizer.
3. NABL standards and Quality Control in Microbiology.
4. Explain in brief about Prebiotics, Symbiotics and Probiotics and its application.
5. Microassay.
6. Pathogenicity Islands.
7. Flow cytometry.
8. Bio Medical Waste Management.
9. Amp 'C' – β lactamases in Gram Negative Bacilli.
10. Biosafety cabinet class 3 and its uses.

III. Reasoning Out: **(4 x 5 = 20)**

1. Standard suspension of insoluble barium sulphate precipitates have been described by Mc Farland.
2. One or two doses of OPV have produced 90-100% seroconversion in advanced countries but not so in developing countries in the tropics.
3. Restriction endonucleases are used in molecular genetics.
4. Uni directional workflow is a must in molecular laboratories.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[MD 0526] **MAY 2026** **Sub. Code: 4012**

M.D. DEGREE EXAMINATION

MICROBIOLOGY

PAPER IV – APPLIED MICROBIOLOGY AND RECENT ADVANCES

Q.P. Code: 204012

Time: Three Hours **Maximum: 100 Marks**

I. Essay: **(2 x 15 = 30)**

1. Quality management system in microbiology. Add a note on road to accreditation.
2. Define Laboratory acquired infections. Classify based on the risk. Write in detail about the measures taken while dealing with these organisms in the laboratory.

II. Short notes: **(10 x 5 = 50)**

1. ABUTI.
2. Biofilm detection methods.
3. Plaque reduction neutralization test.
4. Ventilator associated pneumonia.
5. Diagnostic Stewardship.
6. Dengue vaccine.
7. Catheter Related Blood Stream Infection (CRBSI).
8. Febrile agglutination tests.
9. Biochemical oxygen demand.
10. IgG avidity test.

III. Reasoning Out: **(4 x 5 = 20)**

1. Unidirectional workflow is essential in molecular diagnostic laboratory.
2. Single test showing rise in EBV IgG following fever.
3. Rise in viral load, fall in CD4 count in a patient on ART.
4. Development of vaccine for Hepatitis C is still a challenge.

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