



BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – M.Sc.(MLT)-2024

Course Name – Diagnostic Microbiology & Parasitology

Course Code - MMTC02002

(Semester II)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Microorganisms are classified into different groups. What is the primary basis for this classification?
 - a) Size
 - b) Cell structure
 - c) Nutritional Needs
 - d) All of the above
- (ii) Which method of sterilization is commonly used for the sterilization of surgical packs?
 - a) Autoclaving
 - b) Boiling
 - c) UV radiation
 - d) Filtration
- (iii) Which of the following is NOT a category of biomedical waste?
 - a) Sharps (needles, scalpels)
 - b) Expired medications
 - c) Food scraps from the cafeteria
 - d) Soiled dressings
- (iv) In which of the following phase secondary metabolites are produced during growth?
 - a) Lag phase
 - b) Log/Exponential phase
 - c) Stationary phase
 - d) Death phase
- (v) Identify the chemical agent used for fumigation of OT.
 - a) Halogen
 - b) Formaldehyde
 - c) Alcohol
 - d) UV ray
- (vi) A student wish to study the effect of of an antimicrobial agent that inhibit peptidoglycan synthesis of bacterial cell wall. In which phase of the growth curve should he/she observe the maximum effect of the antimicrobial agent?
 - a) Lag phase
 - b) Death Phase
 - c) Both Lag and Death phase
 - d) None of these

- (vii) What type of personal protective equipment (PPE) is most important to wear when treating a patient with tuberculosis?
- a) Gloves
b) Surgical mask
c) N95 respirator
d) Goggles
- (viii) Choose the correct name of antibiotic which would be most appropriate for treating a patient with a severe penicillin allergy and a suspected gram-negative bacterial infection.
- a) Azithromycin
b) Ciprofloxacin
c) Amoxicillin
d) Clindamycin
- (ix) Choose the microscopy technique that would be best suited for visualizing specific proteins labeled with dyes.
- a) Phase-contrast microscopy
b) Electron microscopy
c) Fluorescence microscopy
d) Darkfield microscopy
- (x) A stool sample is cultured on a medium containing bile salts and crystal violet to inhibit the growth of Gram positive bacteria. Identify the type of medium.
- a) Enriched
b) Selective
c) Differential
d) Differential and selective
- (xi) A wound swab is plated on a medium containing 5% sheep blood. Choose from the following components that aid in the detection of hemolytic activity.
- a) Blood
b) Peptones
c) Agar
d) Sodium chloride
- (xii) What is the primary mode of nutrition in fungi?
- a) Photosynthesis
b) Chemoheterotrophic
c) Autotrophy
d) Lithochemotrophy
- (xiii) Identify the purpose of using MacConkey agar in bacterial culture.
- a) To differentiate between Gram-positive and Gram-negative bacteria
b) To select for lactose-fermenting bacteria
c) To isolate anaerobic bacteria
d) To isolate vibrio cholerae
- (xiv) In which scenario would the presence of flagella be most advantageous for a bacterium?
- a) In a nutrient-rich environment
b) In an environment with limited oxygen
c) In a fluid environment where movement is required
d) In a static environment with abundant resources
- (xv) Select the type of media that contains inhibitors to suppress the growth of unwanted bacteria while allowing the growth of specific ones.
- a) Differential media
b) Selective media
c) Enriched media
d) Indicator media

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Compare and contrast the pathogenesis and clinical manifestations of meningitis caused by bacterial and viral agents. (3)
3. How do you differentiate between gram-positive and gram-negative bacteria? (3)
4. How is antibiotic resistance developed in bacteria? (3)
5. Explain the importance of accreditation of microbiology laboratories. (3)
6. Describe the advantages of using a fluorescence microscope over a bright field microscope for identifying specific microorganisms. (3)

OR

How does a phase contrast microscope enhance the visualization of transparent or unstained specimens in microbiological samples? (3)

Group-C
(Long Answer Type Questions)

5 x 6=30

7. Explain how the immune system differentiates between a live attenuated virus vaccine and a killed virus vaccine, and how each one provides protection. (5)
8. Differentiate between the symptoms caused by E. coli and other common bacterial pathogens associated with urinary tract infections. (5)
9. Discuss the mechanisms of antimalarial drug resistance in Plasmodium falciparum. How can drug resistance be managed in malaria-endemic regions? (5)
10. Analyze the impact of antimicrobial resistance on public health. (5)
11. Analyze the factors affecting microbial growth and their control strategies. (5)
12. How does HIV weaken the immune system, making people susceptible to other infections? (5)

OR

Describe the life cycle of the malaria parasite and how it infects humans. (5)

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