

The West Bengal University of Health Sciences

B.Sc. in Medical Laboratory Technology 3rd Year August-September, 2026 Examination

Subject: Clinical Immunology Mycobacteriology and Applied Microbiology

Time: 3 hrs.

Full Marks : 100

Attempt all questions

Group- A

1. Select the most appropriate option : 10 x 1
 - a) Which of the following component does not participate in innate immunity?
 - i) Neutrophil ii) B- lymphocyte iii) Macrophages iv) NK Cells
 - b) Passive immunity can be conferred directly by:
 - i) Vaccine ii) Colostrum iii) Anti toxins iv) Both (ii) & (iii)
 - c) Which of the following lymphoid tissue is located within the lining of digestive tract?
 - i) MALT ii) Spleen iii) Peyer's patches iv) Lymph nodes
 - d) Humoral immunity is associated with:
 - i) T- cells ii) B- cells iii) Macrophages iv) NK- cells
 - e) The antibody responsible for allergy?
 - i) IgA ii) IgM iii) IgE iv) IgD
 - f) The antibody responsible for placental cross:
 - i) IgM ii) IgE iii) IgA iv) IgG
 - g) Delayed type hypersensitivity is:
 - i) Type- I ii) Type- II iii) Type- III iv) Type- IV
 - h) Which of the following is membrane immunoglobulin?
 - i) IgG ii) IgM iii) IgE iv) IgA
 - i) Antibodies are secreted by:
 - i) T- lymphocyte ii) Memory cells iii) Plasma cell iv) Purkinjee cells
 - j) The primary lymphoid organs are:
 - i) Spleen and thymus ii) Bone marrow & lymph node iii) MALT & thymus iv) Bone marrow & thymus
2. Answer **any four** of the following questions. 4 x 5
 - a) Describe structure of a typical antibody. 5
 - b) Describe humoral & cell mediated branches of the immune system & how are they interlinked. 5
 - c) Differentiate between active & passive immunity. What is primary & secondary immune response? 3+2
 - d) What is delayed type hypersensitivity? Describe type-I hypersensitivity reaction. 1+4
 - e) Describe function of different cells of the innate immunity. 5
3. Answer **any two** of the following questions. 2 x 10
 - a) What is complement system? Describe classical complement pathway. Differentiate between innate & adaptive immunity. 1+5+4
 - b) Describe the B cell development and activation process. Define hapten and adjuvant. 8+2
 - c) Differentiate between B & T cell. What is NK cell and how it works? What is opsonin? Define phagocytosis? 4+2+1+3



P.T.O.

Group- B

4. Select the most appropriate option :

10 x 1

- a) Which of the following is used as solidifying agent for media?
i) Beef extract ii) Peptone iii) Agar iv) Yeast extract
- b) Which of the following is a characteristic of beef extract?
i) Product resulting from the digestion of proteinaceous material
ii) Aqueous extract of lean beef tissue
iii) Aqueous extract of yeast cells
iv) Complex carbohydrate obtained from certain marine algae
- c) Which of the following is a better test to identify coliforms?
i) Coliform index ii) MPN test iii) Multiple tube fermentation iv) Membrane filter technique
- d) Which of the following instrument is used for sterilizing the media after it has been prepared?
i) Autoclave ii) Laminar air flow iii) Inoculum needle iv) Incubator
- e) What are coli form bacteria?
i) Gram positive cocci ii) Gram negative cocci iii) Gram positive rods iv) Gram negative nobs
- f) Temperature used for autoclaving sterilization:
i) 150⁰C ii) 120⁰C iii) 121⁰C iv) 160 ⁰C
- g) MPN stands for:
i) Most Probable Note ii) More Probable Number iii) Most Probable Number iv) Most Possible Number
- h) Biological control is used for autoclaving:
i) Bacillus anthrax ii) Streptococcus iii) Staphylococcus aureus iv) Bacillus steriothermophilus
- i) Water used for culture media preparation should have:
i) Copper ions ii) Alkaline pH iii) High salt concentration iv) Acidic pH
- j) Following methods fall under quality control of staining technique except:
i) Stains should be examined for precipitation ii) Stains should be examined for crystal formation
iii) Check for bacterial contamination iv) Stains should be kept under ice



5. Answer **any four** of the following questions.

4 x 5

- a) Staining techniques.
b) Preparation of culture media for blood agar.
c) Microorganism in the gut.
d) Quality control of water for research purpose.
e) Sterilization process.

6. Answer **any two** of the following questions.

2 x 10

- a) How do you check quality of your prepared cultured media? How does normal flora of gut affect human body? 5+5
b) Name different microorganism present in environment. Write in brief about the pathogenesis of Pulmonary TB. What is presumptive test of TB? 4+4+2
c) Describe different staining technique of microbiology laboratory. How do you isolate microorganism from soil sample? 7+3