


Name:			
Enrolment No:			
UPES End Semester Examination, May 2024			
Course: Diagnostic Microbiology		Duration: 3 Hours Max. Marks: 100	
Semester : II			
Program : M.Sc. (Microbiology)			
Course Code: HSMB7032			
S. No.	Section A	Marks	COs
Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)			
Q 1	All these are the fundamental principle of aseptic technique except: a) Minimization of contamination b) Complete absence of microorganisms c) Proper handling and disposal of microbiological waste d) Regular exposure to microbes for immunity building	1.5	CO1
Q 2	Identify which of the following is NOT a common method for isolating microbiota from the human body? a) Swabbing b) Streak plate method c) Serial dilution d) Fecal transplant	1.5	CO1
Q 3	Recognize which one is NOT a mode of transmission for infectious diseases? a) Airborne b) Vector-borne c) Genetic inheritance d) Fecal-oral	1.5	CO1
Q 4	_____ is an example of a viral infectious disease? a) Tuberculosis b) Malaria c) Influenza d) Chlamydia	1.5	CO1
Q 5	The primary goal of vaccination against infectious diseases is to: a) Treat ongoing infections b) Enhance the immune response to non-pathogenic organisms c) Prevent initial infection or reduce its severity	1.5	CO1

	d) Cure chronic infections		
Q 6	List the symptom which is NOT typically associated with a urinary tract infection (UTI)? a) Dysuria b) Hematuria c) Abdominal pain d) Vaginal discharge	1.5	CO1
Q 7	Select the statements about antibiotics which is FALSE: a) Antibiotics are effective against bacterial infections. b) Antibiotics are effective against viral infections. c) Antibiotics may lead to the development of antibiotic-resistant bacteria. d) Antibiotics may cause side effects such as allergic reactions	1.5	CO1
Q 8	List the following is a characteristic feature of a chronic infectious disease? a) Rapid onset of symptoms b) Short duration of illness c) Persistence of symptoms for an extended period d) Response to vaccination	1.5	CO1
Q 9	Outline the following one, which is a diagnostic criterion for the laboratory diagnosis of tuberculosis a) Positive IgG antibody test b) Acid-fast bacilli in sputum smear c) Elevated white blood cell count d) Presence of eosinophils in peripheral blood smear	1.5	CO1
Q 10	Infections associated with immunodeficiency and immune suppression are often caused by: a) Opportunistic pathogens b) Highly virulent bacteria c) Gram-positive bacteria d) Fungi	1.5	CO1
Q 11	Enteric fever is primarily caused by: a) Salmonella typhi b) Streptococcus pyogenes c) Clostridium difficile d) Escherichia coli	1.5	CO1
Q 12	Streptococcal infections can lead to various diseases, EXCEPT: a) Streptococcal pharyngitis b) Pneumonia c) Tuberculosis d) Impetigo	1.5	CO1
Q 13	Identify the mechanism of action of antibiotics targeting bacterial cell walls a) Inhibition of protein synthesis	1.5	CO1

	<ul style="list-style-type: none"> b) Disruption of cell membrane integrity c) Inhibition of nucleic acid synthesis d) Inhibition of cell wall synthesis 		
Q 14	<p>Minimum bactericidal concentration (MBC) represents:</p> <ul style="list-style-type: none"> a) The lowest concentration of antibiotic that inhibits bacterial growth b) The concentration of antibiotics in the blood at which bacterial growth is inhibited c) The concentration of antibiotics required to kill bacteria d) The concentration of antibiotics required to prevent antibiotic resistance 	1.5	CO1
Q 15	<p>A common symptom of pneumonia is _____</p> <ul style="list-style-type: none"> a) Nausea and vomiting b) Joint pain c) Diarrhea d) Cough and difficulty breathing 	1.5	CO1
Q 16	<p>This is NOT a risk factor for developing pneumonia:</p> <ul style="list-style-type: none"> a) Advanced age b) Smoking c) Regular exercise d) Chronic lung disease 	1.5	CO1
Q 17	<p>This is NOT a characteristic feature of anaerobic infections _____</p> <ul style="list-style-type: none"> a) Abscess formation b) Foul-smelling discharge c) Proliferation in oxygen-rich environments d) Opportunistic infections 	1.5	CO1
Q 18	<p>_____ is used to detect and amplify an antigen-antibody reaction.</p> <ul style="list-style-type: none"> a) Calorimetric biosensor b) Optical biosensor c) ELISA d) Potentiometric biosensor 	1.5	CO1
Q 19	<p>Identify the process of binding of primer to the denatured strand called:</p> <ul style="list-style-type: none"> a) Annealing b) Renaturation c) Denaturation d) None of the above 	1.5	CO1
Q 20	<p>At what temperature does denaturation of DNA double helix takes place?</p> <ul style="list-style-type: none"> a) 54°C b) 74°C c) 94°C 	1.5	CO1

	d) 60°C		
Section B (4Qx5M=20 Marks)			
Q 1	Define the importance of aseptic techniques in microbiology laboratories.	5	CO2
Q 2	Discuss the significance of the human microbiota in health and disease.	5	CO2
Q 3	Describe the geographical distribution, transmission methods, and the challenges related with the diagnosis and treatment of neglected tropical disease.	5	CO2
Q 4	Explain the PCR. What happens at each stage of PCR?	5	CO2
Section C (2Qx15M=30 Marks)			
Q 1	<p>A 25-year-old female visit to the primary care clinic with complaints of frequent urination, a burning sensation during urination, and lower abdominal pain. She also mentions that her urine appears cloudy and has an unusual odor. The patient has no history of urinary tract infections (UTIs) and is otherwise healthy.</p> <p>a) Describe the possible clinical findings and symptoms that may support the diagnosis of a urinary tract infection (UTI) in this patient? (10)</p> <p>b) What steps would you recommend for the diagnosis and management of this suspected UTI case? (5)</p>	15	CO3
Q 2	<p>Sunidhi, a 39-year-old woman arrives at the urgent care clinic with a persistent cough, fever, and difficulty breathing for the past five days. She reports greenish-yellow sputum production, fatigue, and discomfort in her chest.</p> <p>(a) What diagnostic tests and assessments should be performed to confirm the diagnosis and determine the causative agent? (5)</p> <p>(b) Describe the risk factors that can increase an individual's susceptibility to pneumonia. (5)</p> <p>(c) Explain the principles of pneumonia treatment, including the use of antibiotics and supportive care. (5)</p>	15	CO3

Section D
(2Qx10M=20 Marks)

Q 1	Illustrate the mechanism of action of antibiotics and how they target specific components of bacterial cells to inhibit growth or kill bacteria. Describe the significance of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) in determining antibiotic effectiveness.	10	CO3
Q 2	Explain the various types of clinical specimens commonly collected for the diagnosis of infectious diseases. Discuss the importance of proper specimen collection and handling in achieving accurate diagnostic results.	10	CO3