


<b>Name:</b>			
<b>Enrolment No:</b>			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, December 2023</b>			
<b>Course: Diagnostic Microbiology</b> <b>Program: B.Sc Microbiology</b> <b>Course Code: HSMB3002</b>		<b>Semester: V</b> <b>Duration: 3 Hours</b> <b>Max. Marks: 100</b>	
<b>Instructions: Read all questions carefully</b>			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	Cos
Q 1	Which virulence factor enables bacteria to avoid phagocytosis by white blood cells? (A) Cell wall (B) Cell membrane (C) Capsule (D) Pili	1.5	CO1
Q 2	Which of the following microorganisms can grow only as strict intracellular parasites? (A) Bacteria (B) Viruses (C) Fungi (D) Protozoa	1.5	CO1
Q 3	Sterilization is done by autoclave consisting of exposure to steam about (A) 120°C (B) 170°C (C) 121°C (D) 116°C	1.5	CO1
Q 4	A chemical used for the removal of microorganisms from the mucous membrane and skin called (A) Detergents (B) Alcohol (C) Pesticides (D) Antiseptics	1.5	CO1
Q 5	Which of the following body sites or specimens is not considered normally sterile? (A) CSF (B) Blood (C) Skin (D) Urinary bladder	1.5	CO2
Q 6	The proper specimen for diagnosis of a UTI is (A) a clean-catch midstream urine sample (B) a routine, first-morning voided urine (C) a swab of the distal urethra (D) none of the above	1.5	CO2

Q 7	Regarding the proper collection of clinical specimens, which of the following statements is incorrect? (A) Specimens should be collected after antimicrobial therapy is started (B) Specimens should be collected in a manner that will minimize or eliminate contamination of the specimen with indigenous microflora (C) A sufficient quantity of specimen should be collected to allow culture and testing (D) Specimen should be protected from heat and cold as much as possible	1.5	CO2
Q 8	A polypeptide toxin that is secreted by the bacterial cell and released outside called (A) Endotoxins (B) Exotoxins (C) Toxins (D) Virulent factors	1.5	CO2
Q 9	The Gram stain is an example of which of the following types of staining procedures? (A) Simple (B) Structural (C) Differential (D) Selective	1.5	CO3
Q 10	Which of the following is an example of a selective and differential medium? (A) MacConkey agar (B) Blood agar (C) Chocolate agar (D) Thioglycollate broth	1.5	CO3
Q 11	Complete hemolysis (a clear zone) surrounding a colony on blood agar is known as (A) $\alpha$ -hemolysis (B) $\beta$ -hemolysis (C) $\gamma$ -hemolysis (D) $\omega$ -hemolysis	1.5	CO3
Q 12	Which bacterium is described as a Gram-positive coccus in a chain? (A) <i>Staphylococcus aureus</i> (B) <i>Streptococcus pyogenes</i> (C) <i>Escherichia coli</i> (D) <i>Treponema pallidum</i>	1.5	CO3
Q 13	Antibodies are (A) Glycoproteins (B) Secreted by plasma cells (C) Produced by the immune system in response to antigens (D) All the above	1.5	CO4
Q 14	Methods for identification of viruses include all of the following except (A) antigen detection (B) antibody detection (C) molecular diagnostic procedures (D) biochemical assays	1.5	CO4
Q 15	In ELISA technique, the antibodies are labeled by (A) Acridine orange (B) Horse-radish peroxidase (C) Alkaline phosphatase (D) Bromophenol blue	1.5	CO4

Q 16	How many DNA duplex is obtained from one DNA duplex after 4 cycles of PCR (A) 4 (B) 8 (C) 16 (D) 32	1.5	CO4
Q 17	In which of the following methods of antimicrobial susceptibility testing more samples can be analyzed? (A) Agar dilution method (B) Broth macrodilution method (C) Broth microdilution method (D) Disk diffusion method	1.5	CO5
Q 18	Which of the following statements is not true about the disk diffusion method of antimicrobial susceptibility testing? (A) It is also known as the Kirby-Bauer test (B) A pure culture of the organism is required (C) The plate should be incubated in a CO2 incubator for 12 hours (D) The test should be performed in the exact manner described by the Clinical and Laboratory Standards Institute	1.5	CO5
Q 19	A medical lab professional who was testing a QC organism by the disk diffusion method of susceptibility testing found that all the zones sizes were too small. What is the most likely cause? (A) Inoculum was too heavy (B) Agar depth was too shallow (C) The pH of the medium was too low (D) Plate was incubated in a CO2 incubator	1.5	CO5
Q 20	An organism is resistant to an antibiotic means (A) Produce large inhibition zones (B) Able to grow well in the MHA plate (C) Can grow around the impregnated antibiotic disk (D) Cannot grow in the presence of antibiotic disk	1.5	CO5
<b>Section B</b> <b>(4Qx5M=20 Marks)</b>			
Q 1	State any five reasons to justify the importance of diagnosis	5	CO1
Q 2	List any five viral diseases and the associated causative agent	5	CO1
Q 3	Write the collection procedure for blood and stool samples	5	CO2
Q 4	Explain the principle and procedure of endospore staining	5	CO3

<b>Section C</b> <b>(2Qx15M=30 Marks)</b>			
Q 1	<p>A patient presented with symptoms of burning when urinating, cloudy urine, and fever. Write in detail how would you diagnose the disease.</p> <p>A. What would be the preferred sample for analysis, its collection, and the transport procedure?</p> <p>B. What would be the preferred staining and culture method?</p> <p>Explain what molecular methods you would use to identify the microorganism and why?</p>	15	CO2
Q 2	<p>An individual is infected with an unidentified fungal pathogen. You have access to his blood sample and a wound swab.</p> <p>A. To identify the pathogen, explain any two assays that you would perform using the blood sample and justify the selection of your assays.</p> <p>B. How would you select the appropriate antifungal agent for the pathogen and the optimal concentration of antifungal drug for the treatment?</p>	15	CO3
<b>Section D</b> <b>(2Qx10M=20 Marks)</b>			
Q 1	Describe in detail the principle and procedure of PCR, and illustrate a typical PCR cycle	10	CO4
Q 2	Write the procedure for different methods of performing MIC tests and discuss the pros and cons of each method.	10	CO5