Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Diagnostic Microbiology — **Semester: V**
Program: B.Sc Microbiology — **Duration: 3 Hours**
Course Code: HSMB3002 — **Max. Marks: 100**

Instructions: Read all questions carefully

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	Cos
Q 1	The field of parasitology involves the study of which of the following types of organisms? (A) Arthropods, bacteria, fungi, protozoa, and viruses (B) Arthropods, helminths, and certain protozoa (C) Bacteria, fungi, and protozoa (D) Bacteria, fungi, and viruses	1.5	CO1
Q 2	Specimens collected for the laboratory diagnosis of dermatophytes (A) Nail clippings (B) Skin scrapings (C) Blood (D) A and B	1.5	CO1
Q 3	Penicillin is a (A) Primary metabolite (B) Secondary metabolite (C) Tertiary metabolite (D) None of these	1.5	CO1
Q 4	The process of killing or removal of microorganisms is known as (A) Sterilization (B) Pasteurization (C) Disinfectant (D) Destruction	1.5	CO1
Q 5	All of the clinical specimens submitted to the medical laboratory must be (A) properly and carefully collected (B) properly transported to the laboratory (C) properly labeled (D) all the above	1.5	CO2

Q 6	Which of the following statements about CSF specimens is false? (A) Following collection, they should be rushed to the laboratory (B) They are used to diagnose serious conditions such as meningitis and encephalitis (C) They should always be refrigerated (D) They are collected only by physicians	1.5	CO2
Q 7	Which of the following statements about urine culture is incorrect? (A) The best type of specimen is a clean-catch midstream urine (B) There are three parts to a urine culture (C) The container into which the patient urinates should be sterile (D) A white blood cell count is part of the urine culture	1.5	CO2
Q 8	Bacterial toxins that are lipopolysaccharides in nature and are an integral part of the bacterial cell wall are called (A) Exotoxins (B) Toxin (C) Endotoxin (D) Virulence factor	1.5	CO2
Q 9	Which of the following is a good example of a selective medium? (A) Blood agar (B) Chocolate agar (C) MacConkey agar (D) Mueller-Hinton agar	1.5	CO3
Q 10	Fixation of a specimen to a slide accomplishes all of the following except (A) killing the organism (B) anchoring the smear to the slide (C) causing the organism to change to a pink or blue colour (D) preserving the morphology of the cells	1.5	CO3
Q 11	Gram-positive bacteria stain blue to purple because (A) they possess a thick layer of peptidoglycan, making it difficult to remove the crystal violet-iodine complex during the decolorization step (B) they possess a thick layer of cellulose, making it difficult to remove the crystal violet-iodine complex during the decolorization step (C) they are unable to take up the safranin stain (D) none of the above	1.5	CO3
Q 12	Bacterial endospores are a (A) means of reproduction (B) survival mechanism (C) means to inactivate antimicrobial agents (D) means of locomotion	1.5	CO3

Q 13	In which of the following immunodiagnostic techniques are visible masses or “clumps” of particles observed when an antigen-antibody reaction has occurred? (A) Complement fixation technique (B) Agglutination technique (C) Precipitation technique (D) None of the above	1.5	CO4
Q 14	A definitive identification of a bacterial isolate may be accomplished using all of the following methods except (A) immunodiagnostic procedures (B) molecular diagnostic procedures (C) an automated biochemical-based identification system (D) growth on specific types of culture media	1.5	CO4
Q 15	Laboratory diagnosis of HIV infection is usually made by which of the following? (A) Biochemical tests (B) Growth of the virus in chicken embryos (C) Immunodiagnostic procedures for detection of antigen and antibodies (D) Light microscopy	1.5	CO4
Q 16	Western blotting is the technique for the detection of (A) specific DNA in a sample (B) specific RNA in a sample (C) specific protein in a sample (D) specific glycolipid in a sample	1.5	CO4
Q 17	One millimeter is equivalent to how many nanometers? (A) 1,000 (B) 10,000 (C) 100,000 (D) 1000,000	1.5	CO5
Q 18	Which of the following methods of antimicrobial susceptibility testing requires that zone sizes be measured? (A) Agar dilution method (B) Broth macrodilution method (C) Broth microdilution method (D) Disk diffusion method	1.5	CO5
Q 19	Which of the following antibiotics is produced by a mold? (A) Penicillin (B) Bacitracin (C) Chloramphenicol (D) Erythromycin	1.5	CO5

Q 20	The results of a broth microdilution susceptibility test are as follows: Tube Conc. Growth 1 2ug/mL Yes 2 4ug/mL Yes 3 8ug/mL Yes 4 16ug/mL No 5 32ug/mL No 6 64ug/mL No What is the MIC for this drug? (A) 8ug/mL (B) 16ug/mL (C) >16ug/mL (D) None of the above	1.5	CO5
Section B (4Qx5M=20 Marks)			
Q 1	Define diagnosis and list any five types of diagnosis	5	CO1
Q 2	List any five bacterial diseases and the associated causative agent	5	CO1
Q 3	Write the collection procedure for CSF and urine samples	5	CO2
Q 4	Explain the principle and procedure of acid-fast staining	5	CO3
Section C (2Qx15M=30 Marks)			
Q 1	A patient presented with non-stop watery diarrhea, abdominal cramps, vomiting, and fever. Write in detail how would you diagnose the disease. A. What would be the preferred sample for analysis, its collection, and the transport procedure? B. What would be the preferred staining and culture method? C. Explain what molecular methods you would use to identify the microorganism and why?	15	CO2
Q 2	An individual is infected with an unidentified bacterial pathogen. You have access to his blood sample and a wound swab. A. To identify the pathogen, explain any two assays that you would perform using the blood sample and justify the selection of your assays. B. How would you select the appropriate antibiotics for the pathogen and the optimal concentration of antibiotic for the treatment?	15	CO3

Section D (2Qx10M=20 Marks)			
Q 1	Compare the principle of different types of ELISA with illustrations	10	CO4
Q 2	Explain in detail the principle, procedure, and interpretation of the disc diffusion method	10	CO5