



UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : HDD20903
COURSE TITLE : DIAGNOSTIC MICROBIOLOGY
PROGRAMME NAME : DIPLOMA OF MEDICAL LABORATORY TECHNOLOGY
DATE : 26 JANUARY 2026
TIME : 9:00AM - 12:00PM
DURATION : 3 HOURS



INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Section A consist 25 MCQ or EMQ questions. Answer ALL questions.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. *Tick if applicable*
9. Refer to the attached Formula/ Appendies. *Tick if applicable*

THERE ARE 12 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 25 marks)

Answer ALL questions.

Please use the objective answer sheet provided.

1. All of the following are true about *Staphylococcus aureus* EXCEPT
 - A. produces coagulase
 - B. commonly present in intestine
 - C. Gram-positive bacteria
 - D. has cocci shape

2. Identify incorrect statement.
 - A. Mac Conkey Agar isolates only Gram-negative bacteria
 - B. Hektoen Enteric Agar is used to differentiate *Salmonella* sp. and *Shigella* sp.
 - C. MHA Agar isolates fungus only
 - D. Mannitol Salt Agar isolate *Staphylococcus* sp. only

3. Which of the pathogens is a lactose-fermenter bacteria with mucoid colonies?
 - A. *Klebsiella* sp.
 - B. *Proteus* sp.
 - C. *E. coli*
 - D. *Shigella* sp.

4. Determine a fungal pathogen that is categorize as a yeast.
 - A. *Aspergillus* sp.
 - B. *Candida* sp.
 - C. *Penicillum* sp.
 - D. *Dermatophytes* sp.

5. _____ is commonly used to isolate *Aspergillus* species.
- A. Mac Conkey agar
 - B. Mueller Hinton Agar (MHA)
 - C. Blood agar
 - D. Sabouroud Dextrose Agar (SDA)
6. Phenol in Lactophenol Cotton Blue (LPCB) staining reagent is important to _____.
- A. stain or give color to the fungal structures
 - B. kill any living organisms in a specimen
 - C. preserve the fungal structures
 - D. maintain concentration of alcohol in the reagent
7. Negative staining is perform to detect _____.
- A. *Aspergillus fumigatus*
 - B. *Histoplasma capsulatum*
 - C. *Cryptococcus neoformans*
 - D. *Candida albicans*
8. _____ is easily identified by the Germ-tube test.
- A. *Candida glabrata*
 - B. *Candida krusei*
 - C. *Candida albicans*
 - D. *Candida tropicalis*

9. _____ is used to detect *Dermatophytes* in skin scraping sample.
- A. Catalase test
 - B. XLD agar
 - C. Urease test
 - D. 10% KOH mount
10. Which of the sexually transmitted disease (STD) pathogens has spiral shape?
- A. *Treponema pallidum*
 - B. *Neisseria gonorrhoeae*
 - C. *Herpes Simplex Virus*
 - D. HIV
11. _____ is performed to screen syphilis.
- A. RPR (Rapid Plasma Reagin)
 - B. Latex agglutination for *Candida*
 - C. ELISA for HSV
 - D. Widal test
12. Which of the pathogens requires chocolate agar for their growth?
- A. *Trichomonas vaginalis*
 - B. *Neisseria gonorrhoeae*
 - C. *Candida albicans*
 - D. *Mycoplasma* sp

13. Budding yeast cells with pseudohyphae in a genital swab indicates presence of _____.
- A. *Syphillis* sp
 - B. *Gonorrhea* sp.
 - C. *Trichomonas* sp.
 - D. *Candida* sp.
14. Detection of _____ commonly done by serology test rather than direct microscopy.
- A. *Trichomonas vaginalis*
 - B. *Neisseria gonorrhoeae*
 - C. *Candida albicans*
 - D. *Treponema pallidum*
15. A genital lesion showing bacteria with _____ shape under dark-field microscopy confirms syphilis.
- A. cocci
 - B. spirochetes
 - C. spiral
 - D. comma
16. Amies transport medium is a recommended medium for _____ specimen.
- A. CSF
 - B. wound swab
 - C. sputum
 - D. blood

17. _____ is used for the indole test.
- A. Kovac's reagent
 - B. Plasma
 - C. Hydrogen peroxide
 - D. Hydrogen sulphide
18. Bacteria in a pus from an abscess specimen is identified using _____.
- A. India ink stain
 - B. Gram stain
 - C. Negative stain
 - D. Ziehl-Neelsen stain
19. _____ is commonly used for isolation of *Staphylococcus aureus* from wound specimens.
- A. Chocolate agar
 - B. Mueller-Hinton agar
 - C. MacConkey agar
 - D. Mannitol Salt Agar
20. _____ is the best specimen for diagnosing a fungal skin infection (dermatophytosis).
- A. Pus sample
 - B. Blood sample
 - C. Nasal swab
 - D. Skin scraping

21. Moderate level of bacteriuria is usually defined as _____.
- A. $\geq 10^7$ CFU/mL
 - B. $< 10^3$ CFU/mL
 - C. $\geq 10^5$ CFU/mL
 - D. 10^4 – 10^5 CFU/mL
22. Which organism is the MOST common cause of uncomplicated community-acquired UTI?
- A. *Vibrio cholera*
 - B. *Salmonella typhi*
 - C. *Proteus mirabilis*
 - D. *E. coli*
23. _____ is used as a rapid screening method for UTI.
- A. Catalase test
 - B. ELISA
 - C. PCR
 - D. Urine Dipstick test
24. _____ shows swarming colonies on a blood agar.
- A. *Klebsiella pneumoniae*
 - B. *Enterococcus faecium*
 - C. *Proteus mirabilis*
 - D. *Pseudomonas aeruginosa*

25. If a urine specimen can not be processed within 2 hours after collection, it must be kept at _____ to prevent overgrowth of bacteria.
- A. 37°C
 - B. -20°C
 - C. 4°C
 - D. Room temperature

SECTION B (Total: 75 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Gram's staining and culturing are two common techniques used in laboratory for identification of bacteria.

- (a) State two reasons why heat-fixing is performed before staining. (4 marks)
- (b) Explain why prolonged decolorization will affect staining's result. (3 marks)
- (c) Describe the procedure of Gram's staining. (8 marks)
- (d) Give a reason why inoculating loop must be re-heated during streaking technique. (2 marks)
- (e) Give two examples of colony characteristics observed after incubation. (4 marks)
- (f) State two conditions required for successful bacterial growth during culturing. (4 marks)

Question 2

A blood culture bottle flagged positive by the automated system. You are required to perform bacterial identification.

- (a) State two preliminary steps performed immediately after a blood culture becomes positive.

(4 marks)

- (b) Name three culture media commonly used for subculture of positive blood cultures and state the reasons.

(6 marks)

- (c) A 45-year-old diabetic patient presents with high-grade fever and chills. Blood cultures showed the following results.

Refer Below - Table 1 : Blood Culture Results .

Table 1: Blood Culture Results

Test	Result
Gram's staining	Pink, rod shape
Mac Conkey Culture	Colorless
Oxidase test	Positive

- i. Identify the most likely bacteria.

(2 marks)

- ii. State either the the bacteria is a lactose or non-lactose fermenter.

(2 marks)

- iii. Explain the main reason why oxidase test is performed on a Gram-negative bacilli bacteria and its outcomes.

(3 marks)

- iv. Compare the automated blood culture system with the conventional blood culture method for the identification of bloodstream infections.
 - i) Principle
 - ii) Time to detection

(8 marks)

Question 3

Lung infections can be caused by many pathogens. Sample from patients are collected and sent to laboratory to identify the causative agent.

- (a) Name three common Gram-negative pathogens that can be identified from respiratory tract specimens.

(6 marks)

- (b) List two types of respiratory specimens.

(4 marks)

- (c) State two types of sputum appearance.

(4 marks)

- (d) A 45-year-old male presented to the hospital with a 3-month history of persistent cough, weight loss, night sweats, and intermittent fever. Acid Fast Bacilli (AFB) staining showed bacilli bacteria with red color.

- i. Identify the most likely organism.

(2 marks)

- ii. Explain tests to be performed to confirm the infection.

(9 marks)

Question 4

Gastrointestinal tract infections are caused by numbers of pathoges. Laboratory tests are conducted to identify the pathogens.

- (a) List five important steps that must be done before processing the stool specimen to ensure valid results.
(5 marks)

- (b) Give three macroscopic characteristics examined in routine stool analysis.
(6 marks)

- (c) Name two common bacterial pathogens that can cause gastrointestinal tract infections.
(4 marks)

- (d) Outline the laboratory approach to identify bacterial pathogens from stool samples.
(10 marks)

END OF EXAMINATION PAPER

