



UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : HDB30504
COURSE TITLE : CLINICAL LABORATORY MICROBIOLOGY
PROGRAMME NAME : BACHELOR OF BIOMEDICAL SCIENCE (HONOURS)
DATE : 29 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 ONE sections.
4. Section A consist of five questions. Answer FOUR (4) questions only.
5. Please write your answer on the answer booklet provided.
6. Please answer all questions in English only.
7. Refer to the attached Formula/ Appendies. *Tick if applicable*

THERE ARE 6 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

A 45-year-old diabetic patient was admitted with a non-healing, foul-smelling wound on the lower leg. There is greenish discharge with surrounding redness and pain. A wound swab was sent to the microbiology laboratory and the following results were shown in below.

Refer Below - Table1 : Culture from Wound Discharge .

Table 1: Culture from Wound Discharge

Test	Result
Gram stain	Gram-negative rods
MacConkey	Colourless colonies
Oxidase	Positive
Pigment	Green pigment
Odor	Sweet/grape-like

- i. Identify the most probable causative organism based on the laboratory findings.
(2 marks)
- ii. Describe five important laboratory characteristics of this organism.
(10 marks)
- iii. Discuss five clinical significance and complications associated with this infection, especially in diabetic patients.
(10 marks)

- iv. List down three prevention strategies for this type of wound infection.

(3 marks)

Question 2

Answer the questions below.

- i. Describe the morphology and general characteristics of *Staphylococcus* species.

(8 marks)

- ii. Compare *Streptococcus* and *Staphylococcus* based on catalase test and clinical significance.

(6 marks)

- iii. Explain the laboratory methods used to identify Gram-positive cocci.

(6 marks)

- iv. List down five disease related to *Staphylococcus* spp. infection.

(5 marks)

Question 3

A 45-year-old male patient presents to the hospital with fever, chills, and a painful swollen area on his right forearm. The patient has a history of diabetes mellitus. Blood and pus samples were collected and sent for microbiological analysis. The laboratory reports are as follows:

Refer Below - Table2 : Laboratory Results .

Table 2: Laboratory Results

Test	Result
Gram stain	Gram-positive cocci in clusters
Catalase	Positive
Coagulase	Positive
Cefoxitin disc	Resistant
PCR	mecA detected

- i. Identify the most likely causative organism.
(2 marks)
- ii. Justify your answer using the laboratory results.
(15 marks)
- iii. Explain the significance of mecA gene.
(5 marks)
- iv. Recommend at least three infection prevention and control measures that could reduce the spread of this organism in a hospital setting.
(3 marks)

Question 4

Students were provided with an unknown microorganism and its corresponding biochemical test results during their laboratory examination. Answer the following questions based in the table below.

Refer Below - Table3 : Biochemistry Test Results .

Table 3: Biochemistry Test Results

Microbe	Colony on MacConkey Agar	Oxidase Test	Indole Test	Other Key Test	Interpretation
X	Pink colonies (lactose fermenter)	Negative	Positive	Motile	Common cause of UTI, gastroenteritis
Y	Colorless colonies (non-lactose fermenter)	Positive	Negative	Produces green pigment (pyocyanin)	Opportunistic pathogen in burns, pneumonia
Z	Colorless colonies (non-lactose fermenter)	Negative	Negative	H ₂ S production on TSI agar	Causes typhoid fever, gastroenteritis

- i. Based on results in the table, identify the colony for organism X, Y and Z. (12 marks)
- ii. Explain what lactose fermentation indicates about bacterial metabolism. (3 marks)
- iii. Outline the preliminary laboratory staining procedure that should be carried out prior to inoculating the specimen onto MacConkey agar plates. (10 marks)

Question 5

A 30-year-old man develops sudden onset of nausea, vomiting, watery diarrhea, and abdominal cramps after attending a family gathering. He felt generally weak and mildly feverish. Several other attendees also developed similar symptoms within 24–48 hours. A stool sample is sent to the laboratory for viral testing.

- i. Identify the most likely virus and the disease caused by it.
(4 marks)
- ii. Justify your answer in Question (i).
(6 marks)
- iii. Describe five laboratory methods used to diagnose this viral infection
(10 marks)
- iv. State five prevention and control measures for this infection.
(5 marks)

END OF EXAMINATION PAPER

