

BOWEN UNIVERSITY, IWO
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
MICROBIOLOGY PROGRAMME
2022/2023 FIRST SEMESTER EXAMINATION
MCB 305: BACTERIOLOGY

Time allowed: 2hrs 15min

Answer question ONE and any two others.

1. (a) Describe five biochemical tests that can be employed in identifying bacteria using the format below: (10 marks)

S/N	Biochemical test	Principle	Procedure	Result Interpretation

- (b) How will you carry out a Gram staining process? (2½ marks)

- (c) Classify the following organisms as Gram-negative or Gram-positive bacteria:

(i) *Escherichia coli*, (ii) *Staphylococcus aureus*, (iii) *Bacillus cereus*,
 (iv) *Salmonella typhi*, (v) *Mycoplasma* sp. (2½ marks)

- (d) Gambo, a microbiology student, was asked to separate the bacterium Q from other bacterial organisms present in the wastewater produced from the handwash of workers in a factory. List **four** isolation methods this student could use in achieving this goal. (4 marks)

- (e) Table 1 below provides the constituents of media P and Z. Based on your knowledge of culture media for growing bacteria in the laboratory, categorize these media into the appropriate types and give reason(s) for your decision. (5 marks)

Medium P	Medium Z
Glucose 2.0g	Glucose 2.0g
Vit B 0.05g	Beef Extract 4.0g
Potassium	Water 1000ml
Phosphate 0.3g	
Ammonium	
Chloride 0.32g	
Water 1000ml	

- (f) Briefly explain the following terms:

(i) Contaminated culture (ii) Pure culture (iii) Mixed culture (6 marks)

2. (a) Describe endospore formation in a typical bacterial cell (10 marks)

- (b) Write on five (5) each of extracellular structures and plasmids found in a typical bacterial cell. (10 marks)

3. "Members of the family Enterobacteriaceae are agents of many diseases". Discuss. (20 marks)

4. Write short notes on the following:

(a) Enzymes and toxins produced by *Staphylococcus aureus* (10 marks)

(b) Normal habitat, culture and pathogenicity of *Pseudomonas* spp. (10 marks)

5. Describe the following:

(a) Selective and differential media (14 marks)

(b) General purpose media (6 marks)