



UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMMES:

**BACHELOR OF SCIENCE IN AGRONOMY YEAR 2,
BACHELOR OF SCIENCE IN ANIMAL SCIENCE YEAR 2,
BACHELOR OF SCIENCE IN ANIMAL SCIENCE (DAIRY OPTION) YEAR 2,
BACHELOR OF SCIENCE IN FOOD SCIENCE, NUTRITION & TECHNOLOGY YEAR 2,
BACHELOR OF SCIENCE IN CONSUMER SCIENCE YEAR 2,
BACHELOR OF SCIENCE IN CONSUMER SCIENCE EDUCATION YEAR 2,
BACHELOR OF SCIENCE IN HORTICULTURE YEAR 2, AND
BACHELOR OF SCIENCE IN HORTICULTURE YEAR 3 (T)**

COURSE CODE: CP 204

TITLE OF PAPER: MICROBIOLOGY

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE
CHIEF INVIGILATOR**

QUESTION 1

- (a) Draw the bacterial shapes/ flagellar arrangements listed below:
- (i) Bacillus with peritrichous flagellation (2 Marks)
 - (ii) Bacillus with polar monotrichous flagellation (2 Marks)
 - (iii) Streptococcus (2 Marks)
 - (iv) Sarcinae (2 Marks)
- (b) (i) What is the difference between transferrins and interferons? (6 Marks)
(ii) Describe the mechanical and chemical factors in the human body's defences (11 Marks)
- [25 MARKS]**

QUESTION 2

- (a) Describe the different toxic forms of oxygen and how microorganisms overcome their toxicity. (10 Marks)
- (b) Describe the mechanism of phagocytosis (8 Marks)
- (c) Describe the different forms of moist heat used to control microbes. (7 Marks)
- [25 MARKS]**

QUESTION 3

Compare and contrast the following:

- (a) Antibody and antigen (4 Marks)
 - (b) Fimbria and pilli (4 Marks)
 - (c) Innate and adaptive immunity (4 Marks)
 - (d) Reducing and selective media (4 Marks)
 - (e) Microaerophiles and aerotolerant anaerobes (4 Marks)
 - (f) Eukaryotic and prokaryotic cell; giving an example of a microbe with such a cell (5 Marks)
- [25 MARKS]**

QUESTION 4

With the aid of a well labelled diagram, describe the different phases of a bacterial growth curve. Explain clearly what happens at each phase. **[25 MARKS]**

QUESTION 5

- (a) Using the genetic code of mRNA provided, workout the sequence of anticodons that form the following protein: Met- Gly- Asp- Trp- Lys- Leu- Phe –Ile stop (8 Marks)
- (b) Explain the consequence of a single missense mutation, a change from an A to a T in the original DNA strand that was translated to the protein in (i) above, at the position of the fourth amino acid. (10 Marks)
- (c) Work out the protein sequence if a frameshift mutation takes place at the third amino acid whereby the last two nucleotides are deleted. (5 Marks)
- (d) What was the effect of this mutation? (2 Marks)

[25 MARKS]

		Second position					
		U	C	A	G		
First position	U	UUU } Phe	UCU } Ser	UAU } Tyr	UGU } Cys	U	
		UUC } Phe	UCC } Ser	UAC } Tyr	UGC } Cys	C	
		UUA } Leu	UCA } Ser	UAA Stop	UGA Stop	A	
		UUG } Leu	UCG } Ser	UAG Stop	UGG Trp	G	
	C	CUU } Leu	CCU } Pro	CAU } His	CGU } Arg	U	
		CUC } Leu	CCC } Pro	CAC } His	CGC } Arg	C	
		CUA } Leu	CCA } Pro	CAA } Gln	CGA } Arg	A	
		CUG } Leu	CCG } Pro	CAG } Gln	CGG } Arg	G	
	A	AUU } Ile	ACU } Thr	AAU } Asn	AGU } Ser	U	
		AUC } Ile	ACC } Thr	AAC } Asn	AGC } Ser	C	
		AUA } Ile	ACA } Thr	AAA } Lys	AGA } Arg	A	
		AUG Met/start	ACG } Thr	AAG } Lys	AGG } Arg	G	
	G	GUU } Val	GCU } Ala	GAU } Asp	GGU } Gly	U	
		GUC } Val	GCC } Ala	GAC } Asp	GGC } Gly	C	
		GUA } Val	GCA } Ala	GAA } Glu	GGA } Gly	A	
		GUG } Val	GCG } Ala	GAG } Glu	GGG } Gly	G	