COMMONWEALTH OF AUSTRALIA

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CHARLES DARWIN UNIVERSITY

Family Name	
Given Names	
Student Number	
Teaching Period	Semester 2, 2016

FINAL EXAMINATION	**DURATION**
SBI173 – Microbiology	Reading Time: **10** minutes Writing Time: **120** minutes

INSTRUCTIONS TO CANDIDATES

Section A must be answered on the MULTIPLE CHOICE ANSWER SHEET provided. Please ensure that your name and student number are clearly indicated on your Answer Sheet.

Section B must be answered in the Exam booklet provided.

Note that questions in Section B ARE NOT of equal value.

Read ALL questions carefully.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

Any non-programmable calculator is permitted

No handwritten notes are permitted

No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 20 Page Book Faculty/School Multiple Choice Answer Sheet

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Section A

Multiple Choice Questions

Total No of Marks for this section: fifty (50)

This section should be answered on the Answer Sheet provided. Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

Each question is worth 1 mark. Suggested Time allocation for Section A: 50 mins

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Section B
Short answer
Total Number of marks for this section: Sixty (60)

This section should be answered in the exam book provided.
Questions are **NOT** of equal value see each question for mark allocation. Suggested Time allocation for Section B: 70 mins

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Question 1

Compare and contrast bright field microscopy and scanning electron microscopy. That answer should include but not be limited to the type of radiation used, the fundamentals of how the methods work, the resolving powers, and the types of images produced.

(Marks: 4)

Question 2

Please explain, with the aid of a diagram, the basic structure of a Gram-positive bacterial cell envelope. This should include the names and descriptions of the important biochemicals.

(Marks: 4)

Question 3

Describe the important differences between prokaryotes and eukaryotes.

(Marks: 5)

Question 4

How do bacteria move towards attractants and away from repellants?

(Marks: 6)

Question 5

Compare and contrast: 1. oxygenic (ie cyanobacterial and green plant) photosynthesis, and 2. cellular respiration. Include in your answer the roles of these processes in the cell, the main steps of the processes, the reactants and the products

(Marks: 6)

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Question 6

Join the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Osmosis	a) ATP is the energy source
2. Facilitated diffusion	b) Outer membrane porin
3. Group translocation	c) Lactose permease
4. ABC system	d) Active transport
5. Depends on a hydrogen ion gradient	e) Phosphorylation reactions
6. Lower concentration to higher concentration	f) Gram-positive bacteria
7. No periplasm	g) Oxygen and carbon dioxide.
8. Simple diffusion	h) Movement of water across membrane.

(Marks: 4)

Question 7

Join the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Ionising radiation	a) Destruction of DNA
2. Moist heat	b) Pasteurisation
3. Reduction in pathogenic microbes	c) Not growing but still viable
4. Similar effect to dessication	d) Autoclave
5. Ultraviolet light	e) Sterilisation of lab glassware
6. Dry heat	f) Filtration
7. Heat sensitive chemicals	g) Hypertonic environment
8. Bacteriostatic	h) Treatment of surfaces only

(Marks: 4)

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Question 8

Outline the differences between missense, nonsense and frameshift mutations. Include in your answer the general consequences of each class of mutation, in terms of the amino-acid sequence of the gene product.

(Marks: 6)

Question 9

Joint the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Monera	*a) Bortetella*
2. Has flagella inside an outer sheath	*b) Chlamydia*
3. Encompasses the endospore forming bacteria	c) Firmicutes
4. Curved rods	d) Includes nitrogen fixing bacteria
5. Causes pertussis	*e) Helicobacter*
6. ∝-proteobacteria	f) Causes cholera
7. Always live inside host cells	g) Old name for "bacteria"
8. Australian Nobel prize	h) Causes Syphilis

(Marks: 4)

Question 10

Outline the similarities of and differences of brown algae, red algae and green algae.

(Marks: 6)

Question 11

Outline the lytic and lysogenic types of life cycles of bacteriophage

(Marks: 6)

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Question 12

Fill in the blanks in this table.

Organism name	Organism type	Mode of transmission	Common name of disease
Sarcoptes scabiei		Contact and fomites	
		Facial secretions	trachoma
	Virus		Chicken pox
			Tuberculosis
		Respiratory	The flu
		Faecal-oral	Hepatitis
	Bacterium		Gonorrhea

(Marks: 5)

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