

Cork Institute of Technology

Higher Certificate in Science in Applied BioSciences – Award

(NFQ Level 6)

Autumn 2007

Microbiology

(Time: 3 Hours)

Instructions:

Answer **FIVE** questions.

Answer **TWO** questions from each section and **ONE** other from either section.

Use separate answer books for each Section.

All questions carry equal marks.

Examiners:

Dr. D. Gilroy

Ms. M. Lane

Prof. R. Fitzgerald

Section A

Q1. (a) Outline Koch's postulates. (4 marks)

(b) Describe the chemical structure and function of the bacterial cytoplasmic membrane.

(8 marks)

(c) In the Gram stain why does alcohol decolourise Gram negative bacteria? (4 marks)

(d) Describe how you would perform a viable plate count in the laboratory. (4 marks)

Q2. Briefly discuss each of the following treatments used to control microbial growth:

Autoclaving

Pasteurisation

Filtration

Ionising radiation

(20 marks)

Q3. (a) Outline the differences that exist between the following types of media and give an example of each:

Complex

Selective

Differential

(6 marks)

- (b) Why are obligate anaerobes killed by the presence of oxygen? (5 marks)
- (c) Describe methods used to grow anaerobic microorganisms in the laboratory. (5 marks)
- (d) Classify microorganisms according to their temperature preferences. (4 marks)

Q4. Write short notes on *each* of the following prokaryotic structures:

- Capsules
- Plasmids
- Flagella
- Endospores

(20 marks)

Section B

Q5. Write a detailed account of generalised and specialised transduction. (20 marks)

Q6. Write a descriptive account of the catabolic metabolism used by *E coli* in the presence and absence of oxygen. (20 marks)

Q7. Describe how the following are used in the identification and classification of microorganisms.

Serology

Phage host typing

Genetic characteristics

Molecular characteristics

(20 marks)

Q8. Write a detailed account of the *Enterobacteriaceae*. (20 marks)