Cork Institute of Technology

Bachelor of Science (Honours) in Herbal Science – Stage 2

(NFQ Level 8)

Summer 2007

Microbiology

(Time: 2 Hours)

Answer four questions
Answer two questions from Section A
Answer two questions from Section B
Please use separate answer books for each section
All questions carry equal marks.

Examiners: Mr. B. Walsh
Dr. D. Gilroy
Prof. D. Corrigan
Mr. E. Walsh

Section A

Q1. (a) Explain the lytic cycle. (10 marks)

(b) Describe the bacteriophage growth curves. (5 marks)

(c) Describe two methods to enumerate plaque forming units in a liquid sample. (5 marks)

(d) What is meant by lysogeny? (5 marks)

Q2. (a) Write short notes on structure and classification of fungi. (20 marks)

(b) What is a moist chamber and how is it constructed? (5 marks)

Q3. (a) What are the factors influencing the growth of microorganisms? (10 marks)

(b) What is the significance of the lag and log phase of growth? (5 marks)

(c) 50 c.c. of water is mixed with 200 c.c. of diluent. Three subsequent one in ten dilutions are carried out and 0.5 c.c. of the final dilution is plated. After incubation 155 cfus were found on the plate. What was the original count in the sample? (5 marks)

(d) Explain the following terms; Defined, Complex, Selective and Differential media. (5 marks)

Section B

Q4. (a) Outline the principle of the Gram stain. (5 marks)

(b) Summarize Koch's postulates. (5 marks)

(c) Describe the structure, composition and function of Gram positive bacterial cell walls. (10 marks)

(d) In prokaryotes, which transport system is best suited to the transport of nutrients present in the environment in extremely low amounts, and why? (5 marks)

Q5. (a) Write short notes on *three* of the following structures and describe their function in prokaryotic cells:-

- Granules
- Plasmids
- Flagella
- Endospores (15 marks)

(b) With the use of diagrams, describe both a tube dilution method and an agar diffusion method for the assessment of antibiotic activity. (10 marks)

Q6. (a) Discuss *four* of the following treatments used to control microbial growth:

Autoclaving
Pasteurisation
Filtration
Ionising radiation
Chlorine (20 marks)

(b) Why are obligate anaerobes killed by the presence of oxygen? (5 marks)