

Autumn Examinations 2012

Module Title: Enzymes, Energy and Disease CA

Module Code: BIOM6001

School: Science

Programme Title:

Bachelor of Science in Applied Biosciences & Biotechnology – Year 1

Bachelor of Science (Honours) in Pharmaceutical Biotechnology – Year 1

Bachelor of Science (Honours) in Nutrition and Health Science – Year 1

Bachelor of Science in Analytical & Pharmaceutical Chemistry – Year 1

Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance – Year 1

Programme Code: SBIOS_7_Y1
SPHBI_8_Y1
SHNSC_8_Y1
SCHEM_7_Y1
SCHQA_8_Y1

External Examiner(s): Dr. Don Faller

Internal Examiner(s): Ms Margaret Lane, Dr. Fiona O Halloran

Instructions: Answer 4 questions. Question 1 is compulsory.

Duration: 2 hours

Sitting: Autumn 2012

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination. If in doubt please contact an Invigilator.

Question 1: Compulsory

Answer all of the following parts:

- (a) Write the reaction catalysed by the enzyme catalase. Briefly describe the observed effects of this enzyme's activity.
(3 Marks)
 - (b) Explain why apple tissue turns brown when exposed to oxygen.
(3 Marks)
 - (c) What reactions do the following enzymes catalyse?
Amylase, Rennin, Urease
(3 Marks)
 - (d) Explain why vitamin C affects the browning of potatoes and apples.
(2 Marks)
 - (e) Describe two methods you could use to detect the presence of microorganisms.
(2 Marks)
 - (f) What is the purpose of fixing in bacterial staining procedures?
(3 Marks)
 - (g) What information about a bacterial cell is obtained from a simple stain?
(2 Marks)
 - (h) What is the purpose of iodine in the gram stain?
(2 Marks)
 - (i) Explain how heat sensitive liquids are sterilised.
(2 Marks)
 - (j) Explain why 'aseptic technique' is important in a microbiological laboratory.
(3 Marks)
- (25 Marks)

Question 2

- (a) Describe, with the aid of graphs, how pH, temperature and substrate concentration impact on enzyme activity.
(15 Marks)
- (b) Explain the difference between a competitive and non-competitive enzyme inhibitor?
(10 Marks)

Question 3

Write a descriptive note on all of the following:

- (a) Cofactors
- (b) Feedback inhibition
- (c) Allosteric enzymes
- (d) Irreversible inhibitors
- (e) Activation energy

(25 Marks)

Question 4

- (a) Write a summary reaction for glycolysis.

(5 Marks)

- (b) Using two examples you have studied, describe a process that produces ATP in the absence of oxygen.

(20 Marks)

Question 5

- (a) List five types of microorganisms and indicate if they are prokaryotic or eukaryotic.

(5 Marks)

- (b) Describe, using two examples, how microorganisms are beneficial to human welfare.

(5 Marks)

- (c) Write a descriptive account of bacteria.

(15 Marks)

Question 6

- (a) Draw a schematic of the food pyramid.

(4 Marks)

- (b) Describe, giving examples, the difference between a macronutrient and a micronutrient?

(5 Marks)

- (c) What are the functions of fats and carbohydrates in the human body?

(16 Marks)