

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2011/12

Module Title: 21st Century Health (CA)

Module Code: PHOL6004

School: Science & Informatics

Programme Title: BSc in Applied Biosciences – Year 2
BSc (Hons) in Nutrition and Health Science – Year 2
BSc (Hons) in Pharmaceutical Biotechnology – Year 2

Programme Code: SBIOS_7_Y2
SNHSC_8_Y2
SPHBI_8_Y2

External Examiner(s): Dr Don Faller, Dr Jerry Bird, Dr Alison Gallagher
Internal Examiner(s): Ms Anna Murphy

Instructions: Answer any four Questions.

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 paper.
If in doubt please contact an Invigilator.

- Q1 (a) Explain what is meant by Pre-Diabetes to include definition, diagnosis method and the importance of diagnosing the pre-diabetes stage. (8 marks)
- (b) Distinguish between germ line gene therapy and somatic cell gene therapy. (6 marks)
- (c) Distinguish between a benign and malignant tumour. List the main methods by which a malignant tumour can spread in the body. (7 marks)
- (d) State briefly what is meant by an induced pluripotent stem cell. (4 marks)
- Q2 (a) Describe briefly how the body naturally protects itself against free radical attack. (6 marks)
- (b) Describe in detail, giving examples, the clinical parameters that can be used to measure health and wellbeing. (6 marks)
- (c) Distinguish briefly between an adult stem cell and an embryonic stem cell. List the main advantages of using embryonic stem cells over adult stem cells. (9 marks)
- (d) Explain what is meant by an Obesogenic Environment. (4 marks)
- Q3 (a) Write a detailed note on antioxidants in foods and their role in disease prevention in the body. (8 marks)
- (b) State the effects that long term uncontrolled blood sugars can have on the body. (5 marks)
- (c) Write a brief note on Cholesterol to include:
- (i) Effects of LDL and HDL cholesterol on the body
 - (ii) Effects of Dietary fats on LDL and HDL cholesterol levels in the body
 - (iii) Type of foods that lower cholesterol levels in the body
- (6 marks)
- (d) Write a note on high blood pressure (hypertension) to include the risk factors and complications. (6 marks)

- Q4 (a) Describe in detail the process involved in the formation of soft plaque or atherosclerosis in the coronary arteries. (9 marks)
- (b) Describe briefly the main types of carcinogens that can affect the body to include examples of each. (8 marks)
- (c) Describe in detail the mechanisms by which bacteria have developed resistance to antibiotics. (8 marks)
- Q5 (a) Define the term Obesity. Describe the main health consequences that can occur in the body as a result of obesity. (7 marks)
- (b) Write a detailed note on one of the following drug resistant bacteria to include sources of the bacteria, health consequences and prevention/control methods.
- (i) MRSA
 - (ii) *Klebsiella pneumoniae*
 - (iii) *Pseudomonas aeruginosa* (10 marks)
- (c) Describe the main types of diabetes that can occur in the body, to include risk factors for each. (8 marks)
- Q6 (a) Discuss the main concerns in relation to stem cell research and treatment. (6 marks)
- (b) Write a brief note on the functions of retroviruses as a vehicle in gene therapy. (7 marks)
- (c) Describe in detail the following treatments for heart disease:
- (i) Stents
 - (ii) Coronary Angioplasty
 - (iii) Beta Blockers
 - (iv) Plant Stanols/Sterols (4 marks each)
- (Total 12 marks)