

Cork Institute of Technology  
Bachelor of Science (Honours) in Herbal Science – Stage 1  
(NFQ – Level 6)  
Summer 2007  
**Physiology**  
(Time: 3 Hours)

Instructions  
Answer any FIVE questions  
All answers require a diagram of the relevant structure

Examiners: Ms. A. Keaveney  
Dr. D. Corrigan  
Mr. E. Walsh

- Q1. (a) List and discuss the functions of membrane proteins. **(8 marks)**  
(b) Describe the various methods by which materials can cross the plasma membrane. **(12 marks)**
- Q2. (a) Describe the processes by which ossification of bone occurs. **(15 marks)**  
(b) Briefly outline the homeostatic response of the body to decreased levels of calcium in the blood. **(5 marks)**
- Q3. (a) Briefly outline the role of glomerular filtration rate in relation to the homeostasis of body fluids. **(5 marks)**  
(b) Describe the rennin-angiotensin system and discuss its role in the regulation of blood pressure. **(15 marks)**
- Q4. (a) What is a reflex and describe the relationship of reflex arcs to homeostasis? **(8 marks)**  
(b) Describe the role of muscle spindles and tendon organs as sensory receptors in the stretch and tendon reflexes **(12 marks)**

- Q5. (a) Outline the main events in an action potential occurring during contraction of a cardiac muscle fiber. **(8 marks)**
- (b) Describe what happens in the heart during the phases of a cardiac cycle in terms of pressure, volume and heart sounds. **(12 marks)**
- Q6. (a) What are the two mechanisms, by which foods are digested and briefly discuss the main affect of each on the food? **(5 marks)**
- (b) Describe the chemical digestion of food (proteins, fats and carbohydrates) within the digestive system. **(15 marks)**
- Q7. (a) What is pulmonary ventilation? **(5 marks)**
- (b) Describe the processes that occur during pulmonary ventilation including muscle involvement, pressure changes, alveolar surface tension and compliance. **(15 marks)**
- Q8. (a) Briefly discuss the factors that can effect the response of a hormone. **(5 marks)**
- (b) Describe the mechanism of the stress and general adaptation response. **(15 marks)**