Copy of BCC Logo**Belmont City College 2023**

**Year 12 ATAR Human Biology Unit 3**

**Task 3: Test – Homeostasis and Immune Systems**

Name: ………………………………………….………….. **Total Mark /60**

**Section One: Multiple Choice (10 Marks)**

Place a cross (X) through the selected letter:  
  
1. A B C D 6. A B C D

2. A B C D 7. A B C D

3. A B C D 8. A B C D

4. A B C D 9. A B C D

5. A B C D 10. A B C D

**Section Two: Short Answer (30 Marks)**

**Question 11 (7 marks)**

Rosalind goes for a run before breakfast. Use a steady-state control model to show the most important homeostatic mechanism involved in maintaining blood glucose homeostasis while she is running.

**Question 12 (8 marks)**

Free divers are athletes who descend underwater as far as possible without breathing apparatus. Before diving into the water, the free diver deliberately hyperventilates.

1. State what hyperventilation is and what effect it has on the gas concentration of the blood. (2 marks)

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1. Explain how voluntary hyperventilation allows the free diver to stay underwater for longer (3 marks)

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1. Explain how drowning is a risk if a person hyperventilates before diving, even in relatively shallow water: (3 marks)

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**Question 13 (4 marks)**

Immunity can be classed as passive or active and natural or artificial. Complete the table

below, giving definitions and examples of the different types of immunity (4 marks)

|  |  |  |
| --- | --- | --- |
| Description | | |
|  | Passive | Active |
| Natural |  |  |
| Artificial |  |  |

**Question 14 (7 marks)**

Ms Byrne is working in veterinary practice and gets bitten on her thumb by a mouse. The next day, her thumb is red, swollen and painful.

a) Which non-specific immune process is occurring in Ms Byrne’s thumb? (1 mark)

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b) Describe the processes occurring in Ms Byrne’s thumb between when the mouse bites her, and when the stage is set for tissue healing. (6 marks)

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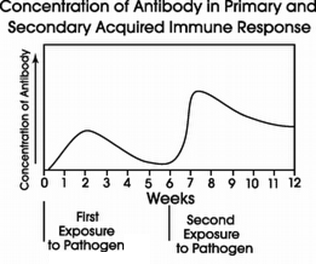
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**Question 15 (4 marks)**

The graph below shows how the body responds to two successive infections of the same viral pathogen. Use this information to answer the question below.



Using the information in the graph above, discuss why it is unlikely that a person who has had this virus and recovered is unlikely to become ill if exposed to the pathogen again. (4 marks)

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**Section Three: Extended Answer (20 marks)**

**Question 16 (10 marks)**

Fever is an important non-specific defence against invading pathogens. Explain how the process of fever works, and explain why someone with a fever would shiver and feel cold, despite rising body temperature

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**Question 17 (10 marks)**

During vigorous exercise, people develop increased rate and depth of respiration. This continues for some time after exercise ceases. Explain why increased rate and depth of respiration continues after exercise ceases.

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