ST MARY’S UNIVERSITY

TWICKENHAM, LONDON

BSc Degree Examination students registered for

Level **SIX**

Title: **Environmental Physiology**

Code: **SPS6012**

Semester: **TWO**

Date: **May 15th 2019**

Time: **1:30 – 3:30 PM**

TIME ALLOWED: **TWO** HOURS

Answer **TWO** questions, each in a **SEPARATE** answer booklet.

1. Cooling strategies are used by endurance athletes prior to competing. Use physiological reasoning to answer the following questions: **a)** Providetwo types of ‘pre cooling’ strategies and explain how their application might affect the heat storage equation (50 marks); **b)** which types of cooling strategies are most successful at reducing core temperature? (30 marks); c) what is a non-thermal cooling strategy and how can it help athletes in the heat? (20 marks).
2. Prolonged exposure to cold temperatures (< 4 °C) can cause some physiological and observable ‘physical’ changes to humans. **a)** Describe the process of thermogenesis and what observable changes occur to denote this? (10 marks); **b)** provide physiological reasons for why cold exposure might affect exercise efficiency (40 marks); **c)** describe and explain why water immersion might change the rate of cooling (40 marks); **d)** providethe physiological reasons for the occurrence of frostbite in severely hypothermic individuals. (10 marks).
3. Exposure to a hypoxic environment can cause some acute physiological changes. **a)** Describe four changes that might occur to various systems of the body (40 marks); **b)** Use these changes to describe how these effects might challenge performance at high altitudes (30 marks); **c)** Describe how acclimation/acclimatization strategies should be designed to be most effective and how they might offset the negative performance effects (30 marks).
4. Fluid balance is important to maintain during prolonged exercise in any environmental conditions; however, certain environmental factors can lead to greater changes in fluid balance. **a)** Provide physiological reasons for how environmental factors, such as heat, cold, altitude or a combination of these could adversely affect fluid balance (40 marks); **b)** In what ways can fluid balance be measured or monitored in the lab or field and what values would be indicative of dehydration? (20 marks); **c)** If an endurance athlete was exposed to environmental heat (> 35 ° C) during competition, explain the short-term strategies that can be used to help them maintain fluid balance in order to complete the race (40 marks).

**END OF EXAMINATION**