RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B. Sc. (General) Degree in Applied Sciences
Third Year - Semester I Examination – November / December 2016

PHY 3203 – PHYSICAL OCEANOGRAPHY

Time: 2 hours

Answer FOUR questions only

1. (a) What are estuaries and why are they important as far as the marine ecosystems are concerned ? [05 marks]

   (b) Distinguish between the Mediterranean Sea and estuaries. [05 marks]

   (c) List the different types of estuaries. [02 marks]

   (d) By way of clear diagrams, discuss the circulation properties and the steady state salinity distribution of one of the above estuary types. [08 marks]

   (e) "*Mississippi and Amazon rivers which carry so much of water may form a Salt-Wedge estuary even with strong tidal mixing*"
   Substantiate the above statement. [05 marks]

2. (a) List the three density zones of the ocean. [05 marks]

   (b) Discuss how a thermocline and/or halocline lead to a pycnocline in the ocean. Use diagrams where appropriate. [05 marks]

   (c) "*The pycnocline tends to disappear at around 50 – 60° North or South latitude*"
   Do you agree with the above statement? Justify your answer. [07 marks]

   (d) Explain two different ways by which a thermocline could be developed in shallow waters near the shore. [08 marks]

3. (a) What is "Principle of Constant Proportions"? [05 marks]

(b) What is the "salinity of seawater" and explain how you determine the salinity of seawater using the "chlorinity of seawater". [10 marks]

(c) What is the "acid-base balance in seawater"? Explain how it prevents broad swings of pH in seawater. [10 marks]

4. (a) Using vectors to represent the velocities of successive layers of ocean water, show that the direction and speed of the movement of water change with increasing depth. [10 marks]

(b) Compare and contrast the equatorial and coastal upwelling and downwelling processes. [08 marks]

(c) Discuss the equatorial upwelling and downwelling processes in El-Nino and non El-Nino conditions. [07 marks]

5. Write short notes on the following.

(a) Tidal locking of the moon. [06 marks]

(b) Thermohaline Conveyer Belt. [06 marks]

(c) Speed of Deep –Water Waves. [06 marks]

(d) Counter currents and undercurrents. [07 marks]

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