RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B. Sc. (General) Degree in Applied Sciences
Third Year - Semester I Examination – September / October 2019

PHY 3203 – PHYSICAL OCEANOGRAPHY

Time: Two (02) hours

Answer **all** questions

1. a) Explain why the surface currents are moving clockwise in the northern hemisphere. **(15 marks)**

b) Distinguish between the western boundary currents and the eastern boundary currents. **(10 marks)**

c) Discuss why the western boundary currents are narrow whereas the eastern boundary currents are broad. **(10 marks)**

d) By way of a clear diagram, explain the Ekman spiral model and Ekman transport. **(15 marks)**

2. a) What are estuaries and why are they important as far as the marine ecosystems are concerned? **(10 marks)**

b) Explain why the tidal power stations are established in estuaries. **(08 marks)**

c) List the different types of estuaries. **(12 marks)**

d) By way of clear diagrams, discuss the circulation properties and the steady state salinity distribution of one of the above estuary types. **(15 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)**

3. a) Discuss how two water bulges are created on opposite sides of the earth due to the gravitational attraction of the tide generating object and the revolution of the earth. **(20 marks)**

b) The lengthening of the day and the recession of the moon are two consequences of tides. Explain these two phenomena in detail. Use diagrams where appropriate. **(20 marks)**

c) What is it meant by "tidal locking" and "mutual tidal locking"? Give one example for each case. **(10 marks)**

4. Write short notes on the following.

a) Thermohaline circulation. **(12 marks)**

b) Conservative and non-conservative elements. **(12 marks)**

c) Coastal upwelling. **(14 marks)**

d) Capillary water waves are deep – water waves. **(12 marks)**

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