



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 1 Examination in Engineering: October 2019

Module Number: CE1101

Module Name: Basic Concepts in Environmental Engineering

SECTION – B

[One Hour]

[Answer all questions. Total Marks 30]

Q1. Sustainable development is defined as the "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs". Recent international report says interest in sustainable investing is growing.

a) Name 4 main drivers for global interest on "Sustainable Development"

[2.0 Marks]

b) Sustainable Design approaches have several goals in common. Briefly explain 4 such common goals.

[2.0 Marks]

c) Sri Lanka Government authorities have initiated to construct the expressway from Kadawatha to Dambulla via Kurunegala under Central Expressway Project (CEP) with a link to Kandy.

i) List two possible factors that may be considered under each Key Sustainable Aspect during the planning of this CEP.

[3.0 Marks]

ii) It is expected some "Environmental Pollution" from this CEP. What is the definition of "Environmental Pollution"? Name three possible environmental impacts from this project.

[3.0 Marks]

Q2.

a) Define the "Water Footprint" with some example.

[1.0 Mark]

b) Water Quality (WQ) characteristics throughout the world are characterized with wide variability. Therefore, the quality of natural water sources used for different purposes should be established in terms of the specific water-quality parameters. Name three basic categories of Water Quality parameters. Give 3 examples of WQ parameters for each category.

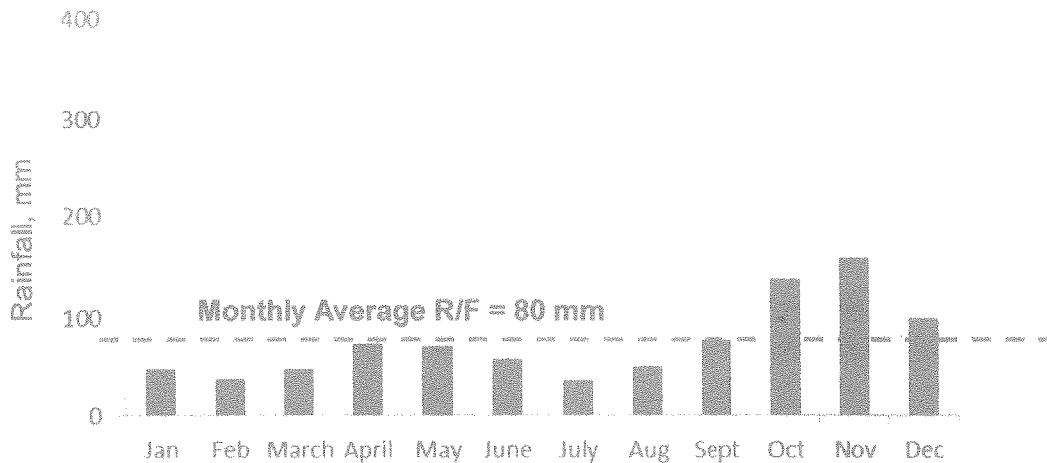
[3.0 Marks]

b) Dissolved Oxygen (DO) is an essential water quality parameter and refers to the level of free, non-compound oxygen present in water. Draw daily DO variation in an urban

lake from early morning to midnight. Briefly explain the reasons for this daily variation.

[3.0 Marks]

- c) Figure Q2 shows the monthly rainfall in a city in Sri Lanka. An institute with 60 members in this area wants to install a rainwater harvesting system at their institute to use rainwater for non-potable use; toilet flushing, car washing, gardening, accounted as 50L per capita/day. They are going to use tile roof area with 30m width and 25m length roof footprint as catchment area. Do you think whether they can collect enough rainwater in every month for their non-portable usage? Justify the answer with a calculation. You may assume any other data if needed.



[3.0 Marks]

- Q3) a) The importance of an EIA as an effective tool for the purpose of integrating environmental considerations into development planning is highly recognized in Sri Lanka. Define the EIA process.

[1.5 Marks]

- b) Name 6 areas that may be predicted and assessed by an EIA process.

[1.5 Marks]

- c) According to the National Environmental Act of Sri Lanka, EIA process is mandatory only for "Prescribed" projects based on two categories. Name these two categories.

[2.0 Marks]

- d) There are 6 basic steps in EIA process in Sri Lanka. Name these 6 steps.

[3.0 Marks]

- e) "Water Disinfection" means the removal or deactivation of harmful microorganisms. Name 4 methods of water disinfection.

[2.0 Marks]