

UNIVERSITY OF RUHUNA**BACHELOR OF SCIENCE IN FISHERIES AND MARINE SCIENCE DEGREE****Level III Semester II Examination****December 2016****LIM 3221 Hydrological Applications****Time 01 $\frac{1}{4}$ hour****Answer for all questions****Part I (20 marks)****Select the correct answer**

1. Choose the incorrect statement
 - a. Efficiency of water use in flood irrigation is less than one
 - b. Drip irrigation is efficient than flood irrigation
 - c. Sprinkler irrigation is a type of localized irrigation technique
 - d. Water loss in flood irrigation is minimum

2. Excess groundwater usage in irrigation causes
 - a. Desalinization
 - b. Salinization
 - c. Recharge groundwater
 - d. Increase infiltration

3. Choose the correct statement
 - a. Displacement of land is not correlated to the precipitation
 - b. Occurrence of landslides induced by rain are strictly correlated with formation of land and duration of rain
 - c. Landslides distribution is not determined by the stratum and geological structure of the area
 - d. The highest number of minor scale earthquakes is detectable after filling a reservoir to the full supply level.

4. Environmental systems are
 - a. small-scale and short-term
 - b. Multi component and laboratory controllable
 - c. Multi scale and multidisciplinary
 - d. Multivariate and linear

5. A small watershed consists of 3 km² of cultivated area ($c = 0.20$), 5 km² forest ($c = 0.10$) and 2 km² grass land ($c = 0.35$). If a rainfall with an intensity of 18.6 cm/h, what is the peak rate of runoff? (C is runoff coefficient)
- 46.5 cumec
 - 124.9 cumec
 - 89.6 cumec
 - 135.9 cumec

Part II (30 marks)

Write your answers only within the provided space

1. List five characteristics of a river that shows longitudinal gradient

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(5 marks)

2. What are the four principles that describe the ecological consequences of altered flow regimes with respect to aquatic biodiversity?

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(5 marks)

3. Define the term "irrigation efficiency"

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(4 marks)

4. Why drip irrigation is considered as efficient than flood irrigation?

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(4 marks)

5. Briefly describe the mechanism of reservoir induced seismicity (RIS)

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(6 marks)

6. “Storm runoff impact to the nutrient dynamics (TP and TN) of bottom sediments in stratified reservoirs”. Justify this statement providing a possible mechanism.

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(6 marks)

Part III (50 marks)

1. Answer all three sections of the following questions

- i. What are the flood controlling methods? (10 marks)
- ii. "Natural floods bring benefits to aquatic ecosystems", briefly explain this statement using suitable examples. (20 marks)
- iii. Suppose you have been appointed as a member to a flood control project and your task is to select the most suitable structures based on cost benefit analysis. Describe, how do you apply cost benefit analysis to select the most suitable structure? (20 marks)