University of Ruhuna
Bachelor of Science in Fisheries and Marine Sciences
Examination, August/ September
Level IV, Semester I

LIM 4132 Water Resource Management
1½ hours

Answer all questions

Part I (15 marks)
Select the correct answer

1. Water resource management is

    i. allocation of water on non-discriminative basis to satisfy users.
    ii. planning, developing, distributing and managing the optimum use.
    iii. competing demands and allocating for all the users.
    iv. planning, developing and managing the water cycle for human use.
    v. allocation of water on an equitable basis to satisfy users.

2. A plot between discharge versus recurrence interval is called:

    vi. Mass curve
    vii. Flood frequency curve
    viii. Flood risk curve
    ix. Rainfall duration curve
    x. Flow duration curve

3. Risk can be defined as:

    i. $\dfrac{\text{Hazard} \times \text{Capacity}}{\text{Vulnerability}}$

    ii. $\dfrac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity}}$

    iii. $\dfrac{\text{Vulnerability}}{\text{Capacity} \times \text{Hazard}}$

    iv. $\dfrac{\text{Vulnerability} \times \text{Capacity}}{\text{Hazard}}$

    v. $\dfrac{\text{Capacity}}{\text{Vulnerability} \times \text{Hazard}}$

4. A hydraulic structure is designated for T-year frequency flood and has an estimated life of N years. The probability that the structure will not fail during its life period is given by:

i. $\left(1-\dfrac{1}{T}\right)^{N}$ 　　　　 ii. $\left(1-\dfrac{1}{T}\right)$ 　　　　 iii. $\left(1-\dfrac{1}{N}\right)^{T}$

iv. $\left(T-\dfrac{1}{N}\right)$ 　　　　 v. $1-\left(1-\dfrac{1}{T}\right)^{N}$

5. The vulnerability can be defined as

  i.   economic loss due to a disaster
  ii.   damage to physical properties
 iii.   potential to suffer from a disaster
 iv.   harmful effects to the environment
  v.   over use of resources

Part II (35 marks)
Write your answer only within the provided space

1. What is meant by the *recurrence interval* of an event?

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2. What is meant by *'environmental flow'*?

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3. What do you mean by flow-duration-analysis. Briefly describe its application.

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4. Write three negative environmental impacts of dams that are being built across rivers.

    i. ....

  ii. ....

 iii. ....

5. Name two International Agreements or Conventions ratified by the United Nations related to freshwater.

i. ....

ii. ....

6. Define Flood Hazard Diagram

i. ....
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ii. Define Hazard Risk Index
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7. Write three different indices used to measure the severity of a drought.

i. ....

ii. ....

iii. ....

8. Explain the probability of exceedance of streamflow and its importance in water management.

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9. Define yield-reliability curve and its importance in storage of water.

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10. Write two direct disadvantages damming of rivers for hydroelectricity generation.

i. ....

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ii. ....

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Part III (50 marks)
Write your answer only within the space provided

1. Describe key steps of water resource assessment and its importance in water resource management

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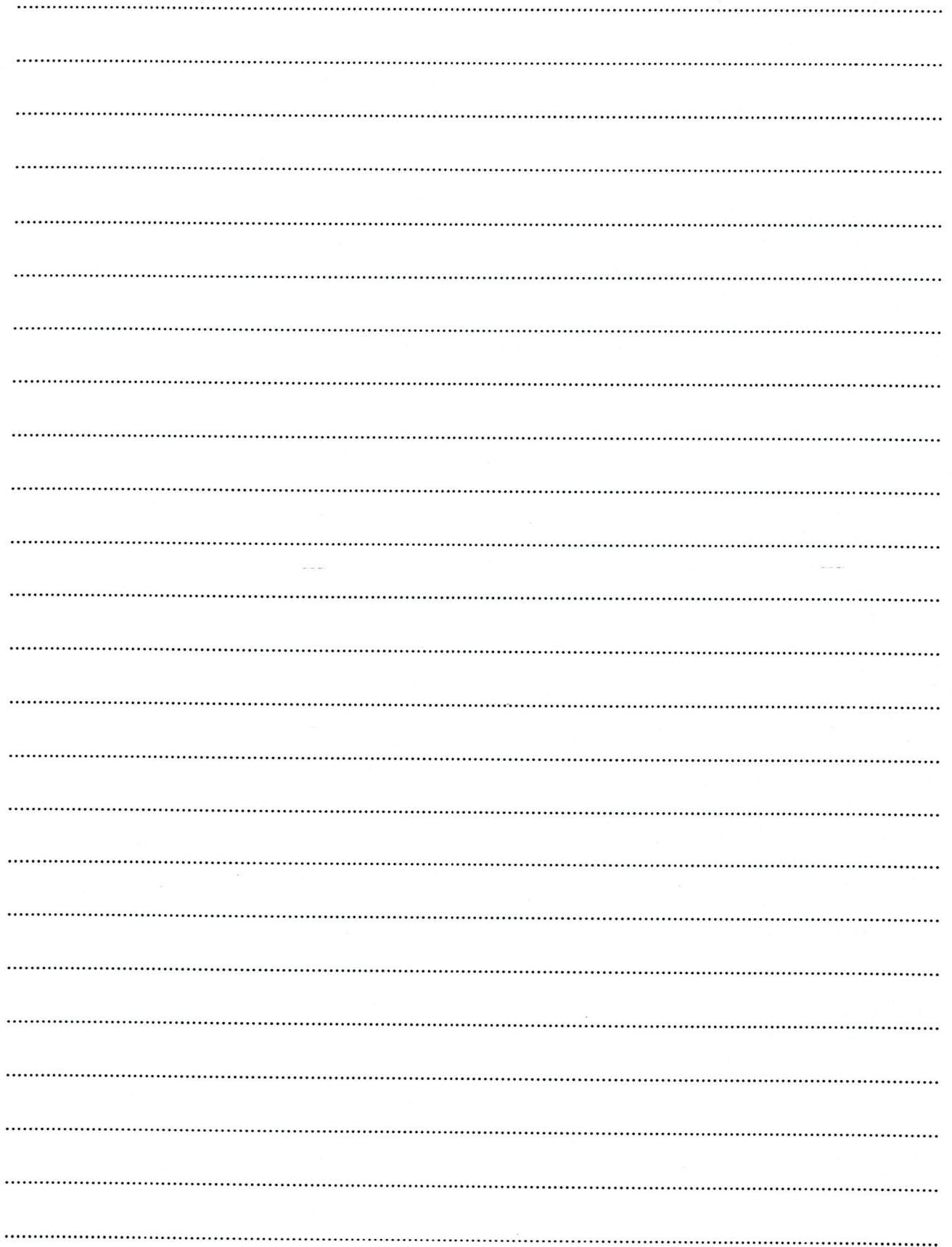..

2. Describe how 'flood' and 'flood response' depend on;
   i.   stream order
   iii.   basin geometry
   iv.   geological substrate

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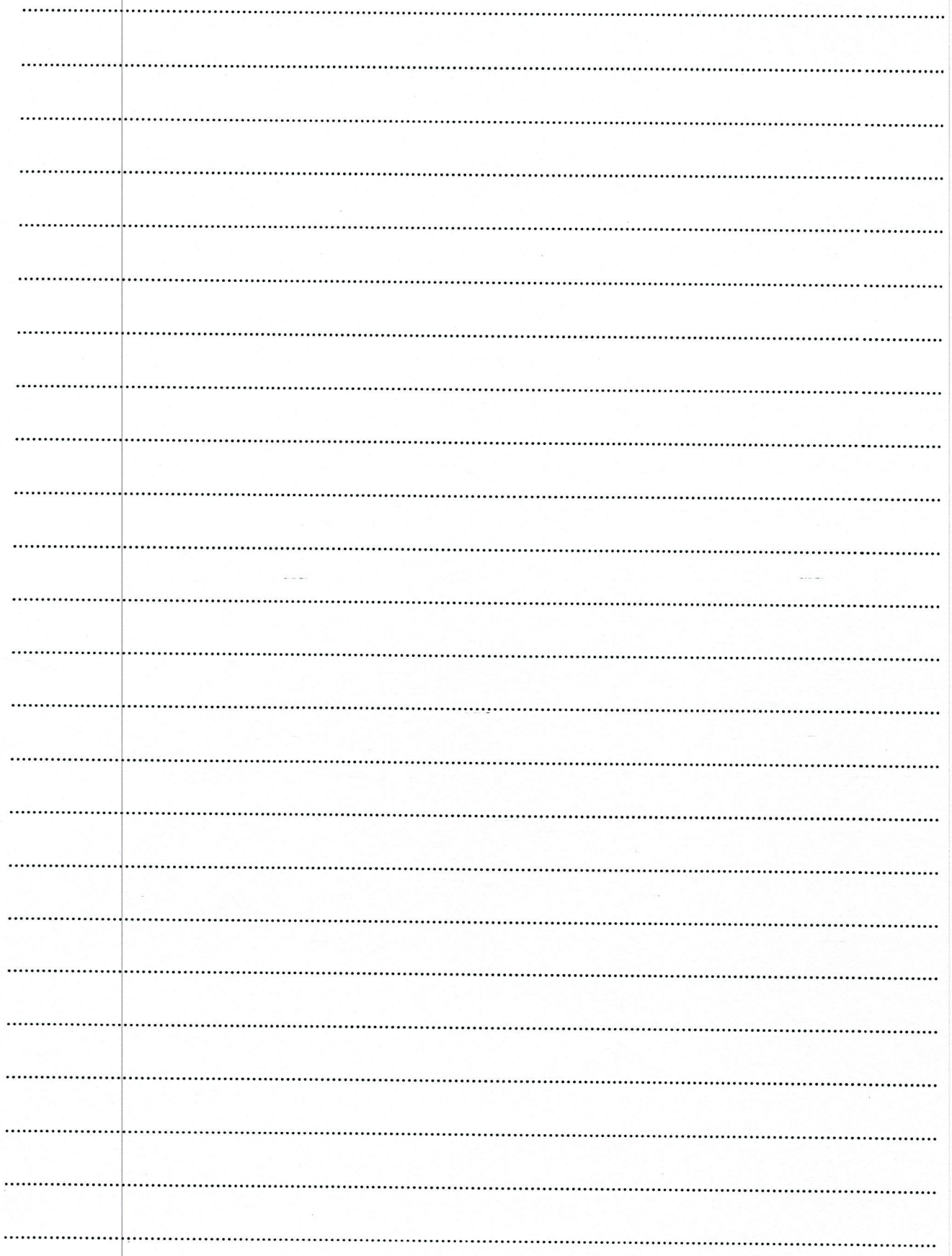
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