

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE AND ENGINEERING**

**AEH 502**

**Department Of Engineering and Physics  
Bachelor of Science (Honours) in Agricultural Engineering  
Surface Irrigation System Technology**

**3 HOURS (100 MARKS)**

**INSTRUCTIONS**

Answer any **FOUR** questions. Each question carries 25 marks.

**JUN 2023**

**Question 1**

- a. Briefly explain the following terms:
- i. Head works. [2 marks]
  - ii. Controlled off take. [2 marks]
  - iii. Irrigation requirement. [2 marks]
  - iv. Quaternary unit. [2 marks]
  - v. Water users. [2 marks]
  - vi. Orifices. [2 marks]
  - vii. Main canal. [2 marks].
- b. Describe the different type of control structures. [15 marks]

**Question 2**

- a. Explain the important requirements for a sound irrigation scheme layout. [15 marks]
- b. As an engineer explain why it is necessary to conform to locally used system of canal identification when designing irrigation and drainage network system. [10 marks]

**Question 3**

- a. Describe in detail the functions of the following structures in irrigation and drainage network system.
- i. Structures for crossing. [5 marks]
  - ii. Structures for water level regulation. [5 marks]
- b. Explain the importance of a preliminary plan in the designing of your irrigation and drainage system network. [15 marks]

**Question 4**

“Reliability and equity are important criteria both with and without water constraint in an irrigation scheme”. Discuss [25 marks]

**Question 5**

During the planning, designing, constructing and operating of irrigation and drainage network schemes several levels of interested parties need to be distinguished and why? [25 marks]

**Question 6**

Describe the main elements of an irrigation and drainage network. [25 marks]

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