



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF SPATIAL PLANNING AND NATURAL RESOURCES**  
**MANAGEMENT**  
**DEPARTMENT OF SPATIAL PLANNING**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF ART IN**  
**SPATIAL PLANNING**  
**SEMESTER2, ACADEMIC YEAR 2021/2022**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: PPB 1304**

**COURSE TITLE: PLANNING FOR WATER AND SEWERAGE**

**EXAM VENUE:**

**STREAM: BA SPATIAL PLANNING**

**DATE:**

**EXAM SESSION:**

**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer question 1 (compulsory) and ANY other 2 questions.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**Question one**

- a) Explain any five factors that affect water consumption. (10 marks)
- b) Discuss how urban hydrology is different from rural hydrology. (10 marks)
- c) Highlight any five qualities of a good water distribution system. (10 marks)

**Question two**

Assume that you are in charge of the planning of a small upcoming town situated on a relatively plain terrain through which a permanent river flows. The national government wants to establish a rice irrigation scheme in the outskirts of the town but not far from the river. Use this information to answer the following questions:

- a) What is the classification of your water supply source for the town? (2 marks)
- b) Name and justify the water distribution system you would use to supply the town. (5 marks)
- c) Name and justify the water distribution system you would use to supply the proposed irrigation scheme. (5 marks)
- d) Explain why an impounding reservoir would not be appropriate for water harvesting for this town. (3 marks)
- e) List possible alternative water sources for the residents of this small town. (5 marks)

**Question three**

- a) Explain the following terms; sewage, sewer, sewerage. (6 marks)
- b) Discuss why wastewater can range from between 70 to 150% of per capita water consumption in an urban setting. (4 marks)
- c) Discuss the advantages and disadvantages of the dry conservancy and water carriage sewage collection systems. (10 marks)

**Question four**

- a) Explain the three sewerage systems. (10 marks)
- b) Discuss the pros and cons of disposing treated sewage on land and in water bodies. (10 marks)

**Question five**

- a) Explain four factors to consider when locating the site of an open dumpsite or sanitary landfill. (8 marks)
- b) Discuss, with examples, the classification of wastes depending on their potential for being a resource. (12 marks)