

UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
DIPLOMA IN ENVIRONMENTAL HEALTH
MAIN EXAMINATION PAPER 2013

TITLE OF PAPER : **Fundamentals of Sewage Treatment**

COURSE CODE : **EHM 213**

DURATION : **2 HOURS**

MARKS : **100 MARK**

INSTRUCTIONS :

- READ THE QUESTIONS & INSTRUCTIONS CAREFULLY**
- ANSWER ALL FOUR QUESTIONS**
- EACH QUESTION CARRIES 25 MARKS**
- WRITE NEATLY & CLEARLY**
- NO PAPER SHOULD BE BROUGHT INTO NOR OUT OF THE EXAMINATION ROOM**
- BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER**

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR

QUESTION ONE

- a) Using a sketch, show four points where manholes are provided in a drainage works. **(8 marks)**
- b) Mention five defects that might occur in a trap for a sanitary fitting. **(10 marks)**
- c) Mention three methods that can be used for testing drain's efficiency. **(3 marks)**
- d) With the use of a sketch, show the depth of a seal. **(4 marks)**

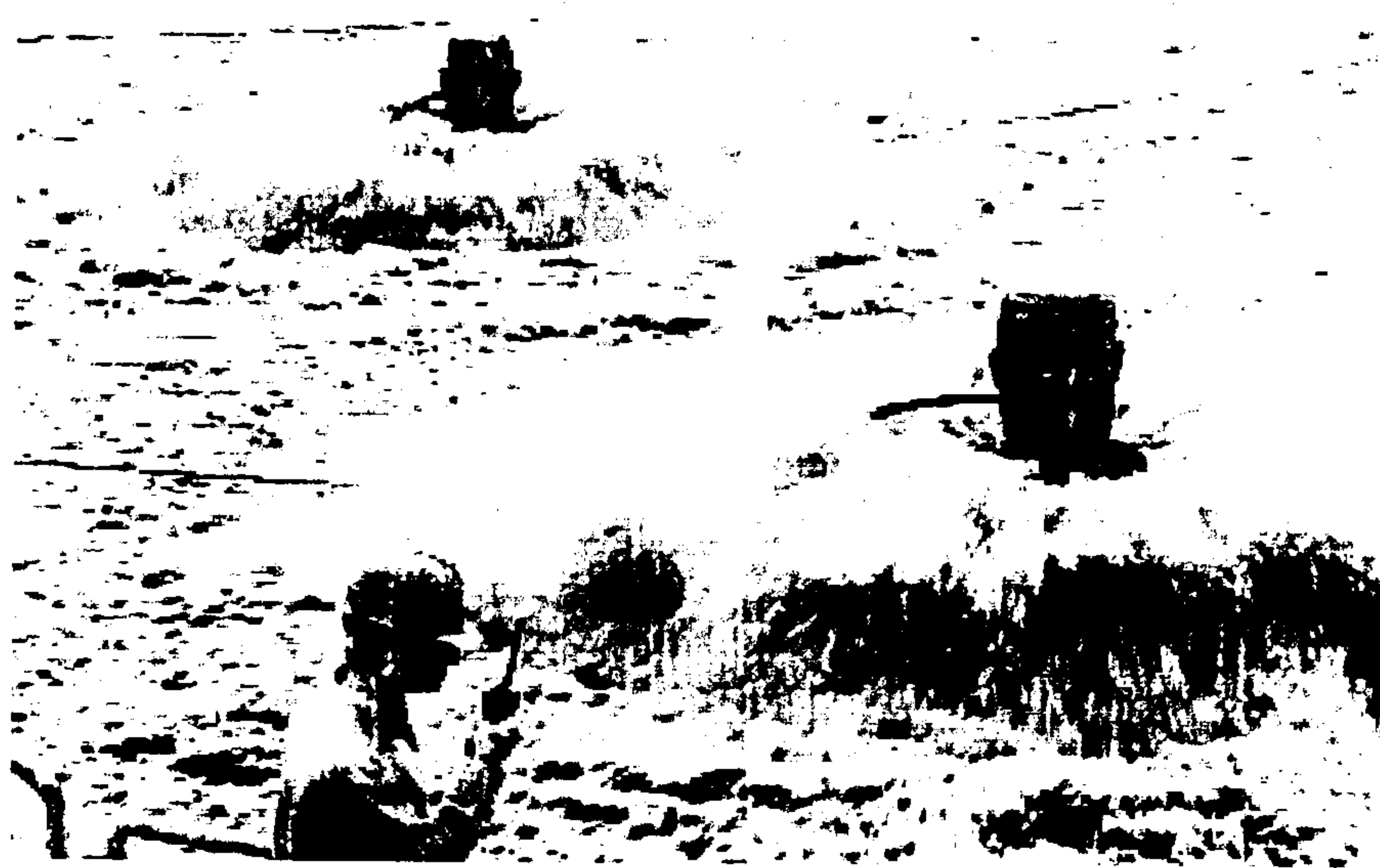
QUESTION TWO

- a) What is a sanitary fitting in building construction? **(3 marks)**
- b) Describe how water closet (W/C) cistern operate **(10 marks)**
- c) Mention three types of urinals that can be used in male toilets. **(6 marks)**
- d) Describe two way of ventilating drains **(6 marks)**

QUESTION THREE

- a) A company produces wastewater with pollution levels exceeding limits for municipal sewer line discharge; describe how you will persuade the company to install an onsite pre treatment before discharging into a municipal sewerage system. **(10marks).**
- b) You are an environmental health officer employed by the Government of Swaziland. You are asked to design a trickling filter system to treat wastewater. Mention the five data type you will need and its purpose? **(5 marks)**
- c) You are employed by the Matspa Town Board and you are assigned to investigate the source of pollution in the Great Usuthu. In your preliminary investigation you find that there are two companies in the area that use material which contain the pollutant you found in the river and that the acts of polluting occur at night. What further investigation will you conduct to identify the company that is polluting? **(10 marks)**

QUESTION FOUR



- (a) In the conventional wastewater treatment plant system, where does the above form of treatment occur and for what purpose? **(5 marks)**
- (b) Describe five precautions that ought to be observed in the operation of the treatment process shown above. **(10 marks)**
- (c) Mention five advantages of free oxygen over bonded oxygen in wastewater treatment by activated sludge process. **(10 marks)**