

UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

**DIPLOMA IN ENVIRONMENTAL HEALTH
SCIENCES**
MAIN EXAMINATION PAPER MAY 2009

TITLE OF PAPER : SEWAGE TREATMENT

COURSE CODE : EHS 204

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ANY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

**: 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**

EHS 204 P MAIN EXAM MAY 2009

QUESTION ONE

- (a) Sewage systems capable of handling storm water are known as combined systems. Describe the features of this drainage system stating why municipalities normally avoid its use [5]
- (b) Outline the pre-design basic data considerations for a waste water treatment plant [10]
- (c) You are in charge of the Matsapa stabilization ponds which serve 50000 inhabitants. What would be your operation and inspection schedule for the ponds? [10]

QUESTION TWO

- (a) Treated effluent and sludge represents an important by product of a waste water treatment plant. Outline problems associated with each one of these by products. [10]
- (b) Sewage collection and treatment is typically subject to regulations and standard controls. Articulate at least five of each applicable to Swaziland [10]
- (c) How do stabilization ponds treat sewage [5]

QUESTION THREE

- (a) Define the following terms: sewage, sewer, sewerage [6]
- (b) Give an example where the knowledge of drainage can be useful to the work of an Environmental Health Officer. [1]
- (c) Give four requirements of a good design of a sanitary fitting [4]
- (d) What is a sanitary fitting? And give three different types of sanitary fittings [6]
- (e) Account for the need to carry out sewage treatment [8]

QUESTION FOUR

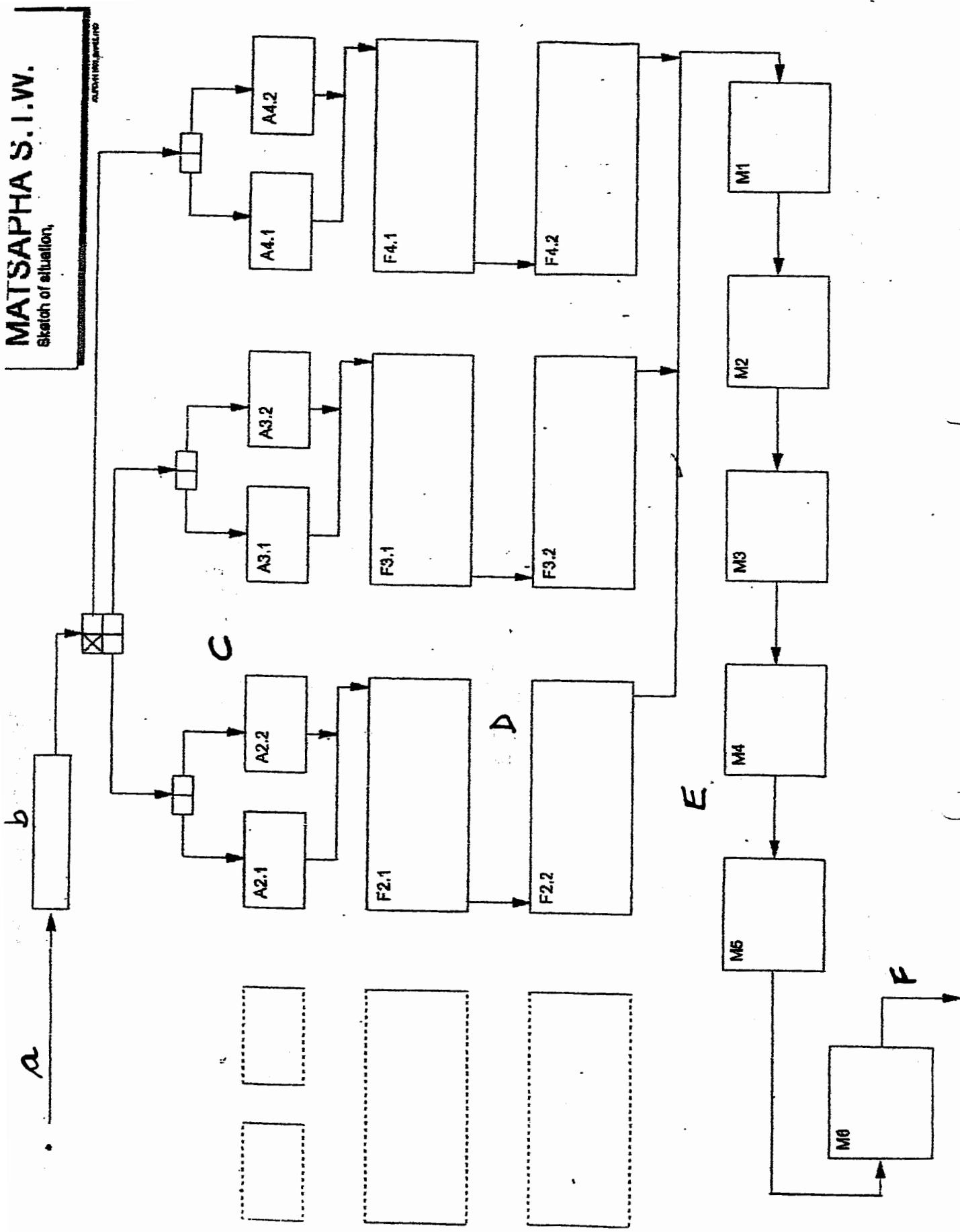
- (a) Describe the under listed methods of drain testing and indicate under what circumstances would you use them i) smoke test and ii) water test [10]
- (b) Clarify and critically comment on the statement that the Nhlambeni and Ezulwini modern waste water treatment plants are far better than the traditional stabilization ponds found in Matsapa [10]
- (c) Discuss the common problems associated with drainage pipes [5]

QUESTION FIVE

- (a) Mention the three disadvantages associated with the use of concrete pipes in a drainage system. [3]
- (b) What are the ripple effects of leaking drain pipes [5]
- (c) The following diagrams (A and B) represent the Matsapa Stabilization ponds and the Nhlambeni Waste Water Treatment plants respectively. Label (a,b,C,D,E,F,G,H,I,J,K, and L in these two diagrams. [12]
- (d) Describe a bidet and outline some of the challenges some people may face when using a bidet [5]

MATSAPHA S. I. W.
Sketch of situation,

current line



GRAM
A

DIAGRAM B

Nhlambeni Wastewater Treatment Works

MANZINI WWTP
Flow Chart

