

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE

MAIN EXAMINATION PAPER DEC 2017

TITLE OF PAPER : BUILDING CONSTRUCTION
TECHNOLOGY I

COURSE CODE : EHS 203

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ANY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

**: 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) You are asked to give a talk on sustainability in the construction industry. What would be your main points? Discuss at least ten main points on the subject. [10]
- (b) What is the meaning of the statement “Construction is both an issue of national and individual development”? [3]
- (c) Precipitation, wind and relative humidity are amongst the five climatic elements that have to be taken care of in a building to avoid poor indoor climate affecting comfort, health and efficiency. Discuss the problems associated with each of these elements and state proposed mitigation measures in a construction structure [12]

QUESTION TWO

- (a) Using simple sketches describe the three types of stresses in building construction [3]
- (b) Critically discuss the differences between structural steel and reinforcement steel in building construction [4]
- (c) There is often need for removal of top soil in preparation for building commencement. Give three reasons usually given for this removal [3]
- (d) What are the factors related to ground conditions that help guide selection of foundation types? [5]
- (e) Describe the LCA process in the construction industry [10]

QUESTION THREE

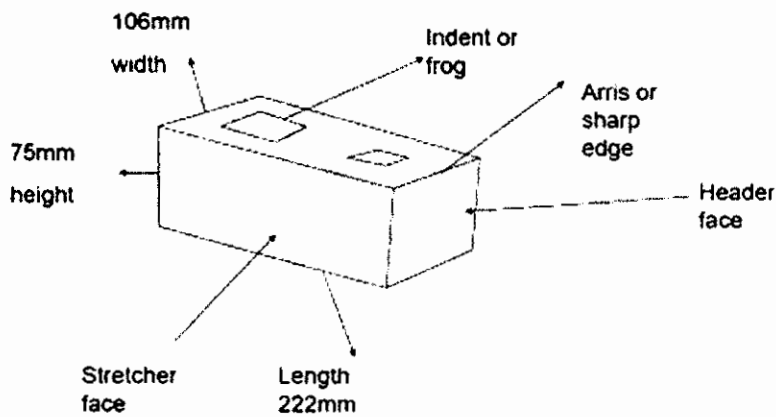
- a) In order to carry out a proper site investigation there are typically three basic questions to ask. State these questions. [3]
- b) Concrete is a mixture of four basic ingredients.
 - i. Name the four ingredients [4]
 - ii. What is the function of each of these ingredients [4]
 - iii. Concerning concrete mix requirements explain what is meant by 1:3:3 [2]
 - iv. Given the mix 1:3:3 above having cement mass of 50kg, what would be the mass of the other two ingredients? [2]
 - v. What do you call the reaction between water and cement in concrete making [2]
- c) Differentiate between fresh concrete and hardened concrete [4]

- d) Sketch out a roof structure and label accordingly to demonstrate the notion “ Roofs like most construction components are designed to withstand two principal forces namely
1. Compression (squashing forces) [2]
 2. Tension (stretching forces) [2]

QUESTION FOUR

- (a) Identify the bonds for the description given below:
- i. This bond is used above doors and window openings. Bricks are placed with the headers facing the outside. [3]
 - ii. Bricks are placed with their longest side facing the outside of a wall. This bond is used for the main wall section [3]
 - iii. This bond consist of alternate course of headers and stretchers [3]
- (b) Differentiate between the slump test and the cube test [6]
- (c) Sketch out an imaginary typical site layout to depict appropriate site layout. [8]
- (d) Given that a brick has the following dimension.

Brickwork terminology



- i. What is the size of a mortar joint? [1]

- ii. What is the area of the brick? [1]

QUESTION FIVE

- a) Draw sketches to depict the following in brickwork terminology; [5]
- i. Tothing
 - ii. Quoin or corner brick
 - iii. Perpend
 - iv. Lap
 - v. Bat
- b) Describe ten items that make up a typical expenditure profile for a building project and state at what phase of the project each item is required. [10]
- c) Describe five key elements in a contracts document [5]
- d) Which building material is most suitable for the following component part of a building? You may suggest more than one building material. [5]

COMPONENT PART OF BUILDING	SUGGESTED BUILDING MATERIAL
Roof truss	
Window frame	
Floor slab	
Foundation	
Walls	