

# UNIVERSITY OF SWAZILAND Faculty of Health Sciences

### **DIPLOMA IN ENVIRONMENTAL HEALTH**

## **FINAL EXAMINATION PAPER 2007/2008**

TITLE OF PAPER : BUILDING CONSTRUCTION TECHNOLOGY I

COURSE CODE : EHS 210

DURATION : 2 HOURS

MARKS: 75

INSTRUCTIONS : READ THE QUESTIONS & INSTRUCTIONS

**CAREFULLY** 

: ANSWER THREE (3) QUESTIONS - QUESTION ONE

(1) IS COMPULSORY

: 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

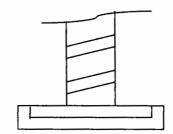
OF PAPER.

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

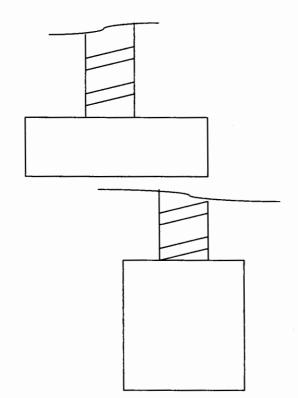
## **QUESTION ONE**

## COMPULSORY MULTIPLE CHOICE QUESTION. Choose one answer for each [1 marks per point]

1. Which sketch illustrates an isolated pad foundation?

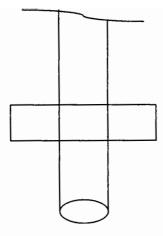


a.



c.

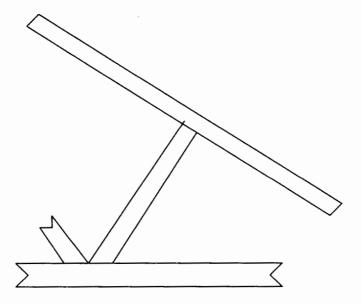
b.



d.

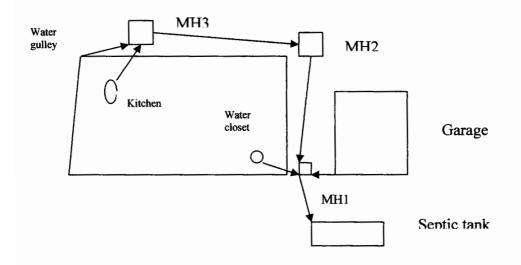
- 2. When designing and selecting a foundation it is necessary to:
  - a. Know the water table
  - b. Calculate the loads on the foundation and determine the nature of subsoil and ground water level, changes and the possibility of the ground soil movement.
  - c. Calculate the number of walling unit plus the roof and its covering
  - d. Know the type of cement to be used and the amount of salt in the soil.
- 3. The basic objective of site investigation is:
  - a. To collect systematically and record all necessary data which will be needed or help in the design and construction process of the proposed work.
  - b. To give reference points for setting out the proposed work
  - c. To obtain subsoil samples for identification, classification and ascertaining the subsoil characteristics
  - d. To determine the suitability of the site for the proposed project
- 4. The main method used by the architect to communicate ideas and designs to the builder is
  - a. telephone messages
  - b. drawings, plans, & details
  - c. manufactures information sheets
  - d. video tapes
- 5. The wall thickness and foundation widths when setting out a building are marked on
  - a. the ground floor
  - b. the concrete slab
  - c. the profile board
  - d. the four stout pegs
- 6. Reasons for removing vegetable soil are:
  - a. to avoid growth of plants, shrubs or trees
  - b. to have a firm base to cast concrete slab
  - c. to minimize dampness under floors
  - d. to act as dpc
- 7. Batching refers to

- a. stacking of building materials
- b. stumping base in preparation for putting foundation
- c. producing fresh concrete
- d. non of the above
- 8. The term COURSE in brick or block wall construction means
  - a. The number of bricks or blocks in a line of bricks or blocks.
  - b. A line of brick or blocks in the height of a wall
  - c. The pattern of laying the bricks or blocks
  - d. The number of lines of vertical and horizontal mortar joints
- 9. The term BUILT ENVIRONMENT can be defined as
  - a. Gods creation
  - b. rivers, and seas
  - c. Created by man with or without the aid of the natural environment
  - d. Surroundings which can be natural
- 10. The following constitutes conditions that may render a soil unsuitable for foundations:
  - a. Natural low bearing capacity of soil
  - b. Low water table
  - c. Presence of layers of highly incompressible subsoil such as peat
  - d. Recently placed filling material which have been sufficiently consolidated
- 11. The dangers of import building materials are that:
  - a. They always carry health risks
  - b. They may be of suspect properties and performance in local conditions
  - c. They always lead to problems with moisture and moulds
  - d. They are always expensive to buy
- 12. Water used for concrete making should be:
  - a. A bit salty to enhance better bonding
  - b. Be same as for drinking
  - c. Turbid for quick mixing
  - d. Hot
- 13. On undulating site, which type of foundation could be adopted?
  - a. Wide strip foundation
  - b. Trench fill foundation
  - c. Stepped strip foundation
  - d. Wide strip foundation



The above structural member represents a

- a. cantilever beam
- b. vertical strut subjected to tensile forces
- c. strut subjected to compression forces
- d. tie subjected to tension forces
- 15. The interface between the natural and built environment is
  - a. not important
  - b. helps determine how to build a strut
  - c. is important for internal furnishing
  - d. symbiotic
- 16. Which bond is recommended for block work?
  - a. English bond
  - b. Stretcher bond
  - c. Flemish bond
  - d. Quarter bond
- 17. The sketch below illustrates which type of a drainage system
  - a. Partially separate system
  - b. Combined system
  - c. Separate system
  - d. Subsoil drainage system



- 18. In a drainage system what provides a means for collecting and controlling the seepage of rainwater into surrounding granular subsoil
  - Inspection chamber
  - b. Manhole
  - c. Sewer
  - d. Soak away
- 19. The subject Building Construction Technology is divided into
  - a. Substructure and superstructure
  - b. Modern and outdated construction methods
  - c. Timber and concrete
  - d. Theory, quantity surveying and drawings
- 20. In order to make a good contribution to the construction sector one needs
  - a. training, practical competence and experience
  - b. to be a good EHO
  - c. to be a good painter
  - d. a lot of experience only
- 21. Adaptability to changing housing needs means
  - a. getting rich
  - b. expanding the house
  - c. recycling
  - d. LCA
- 22. Environmental considerations in the building construction sector
  - a. Require complete removal of top soil and trees before putting up a building
  - b. Favour blending of natural and built environment
  - c. Is not that important as log as planning requirements are met
  - d. Cannot delay commencement of building construction activities



- 23. Fossil fuels
  - a. Are not important in the construction sector
  - b. Are the concern for the contractor
  - c. Last many decades so there is no need to worry
  - d. are finite
- 24. The LCA process
  - a. Refers to local community association
  - b. Has four important phases
  - c. Help define how different materials and operations influence the environment over a longer period of time
  - d. Must always be carried out in an All in contract.
- 25. The basic form and type of structure help
  - a. Determine the internal façade of a building
  - b. Decide on the type of foundation
  - c. Determine the external envelope of the building
  - d. Engineers carry out site excavations

#### **QUESTION TWO**

- (a) Describe the important site lay out consideration for a successful construction project [5]
- (b) Consider the following methods used in excavation (I) Cut and fill

(ii) Cut

(iii) Fill

Draw sketches for each and comment on advantages and disadvantages of each. [10] (c) The building construction industry is the largest energy consuming sector. Clarify and critically comment on the implications of this to the work of an Environmental Health Officer and the construction site engineer. [10]

#### **QUESTION THREE**

- A) One of the most important site considerations is safety and health. Discuss this consideration and also list the applicable regulations. [10]
- B) Wind is one of the most important factors impacting on completed building structures. Discuss factors that contribute to this impact in the external environment. [5]
- (C) Vertical construction serves two purposes. What are they? [5]
- (D) Summarise the impacts of construction on land [5]

#### **QUESTION FOUR**

A) Describe the methods and phases used to measure how different materials and operations within the building construction industry influence the environment over a

long period of time. Give an example of at least one building material to demonstrate your understanding of this methodology [15]

B) Write a few notes on the building material called 'AGGREGATE' then complete the following matrix related to its particle sizes [5]

NAME	SIZE OF PARTICLES
Coarse gravel	60.0-20.0mm
Fine gravels	
Coarse sand	2.0-0.6mm
	0.2-0.06mm
Course silt	0.06-0.02mm
	0.006-0.002mm
clay	

C) Outline four important issues to consider when dealing with contracts [5]	