INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

CONSTRUCTION TECHNOLOGY 1

BCE 2106

SECOND YEAR FINAL EXAMINATION SEMESTER 1: 2025

Date: 23.04.205 Time: 3hrs

Instructions

(1) This examination paper contains eight questions spread in two sections

(2) Answer any five questions for full marks

(3) Each question carry equal marks

(4) Submit all used answer book

SECTION A

Question One (20 Marks)

(a) Define foundation as related to a structure (1 marks)

(b) State four function requirements of foundations (4 marks)

(c) Outline factors that influence the choice and design of foundation (4 marks)

(d) With aid of sketches define the following types of pile foundation: - (6 marks)

(i) Friction piles

(ii) End bearing piles

(e) With aid of sketch outline parameters of stepped strip foundation (3 marks)

(f) Foundations are classified as deep and shallow foundations give two examples of each (2 marks)

Question Two (20 Marks)

(a) What do you understand by the term wall as related to construction technology? (2 marks)

(b) Walls are generally classified into four main categories. Name these four main classification of walls as related to type of loadings. (4 marks)

(c) Outline six basic function requirements of walls in relation to construction technology (5 marks)

(d) With aid of named sketches define the following:-

(i) Parapet wall

(ii) Reinforced retaining wall

(iii) Cavity wall (9 marks)

Question Three (20 marks)

(a) Define the term setting out as related to buildings (1 mark)

(b) Mention three fundamental stages of setting out a building (3 marks)

(c) Using figure 1 below explain the following: - (4 marks)

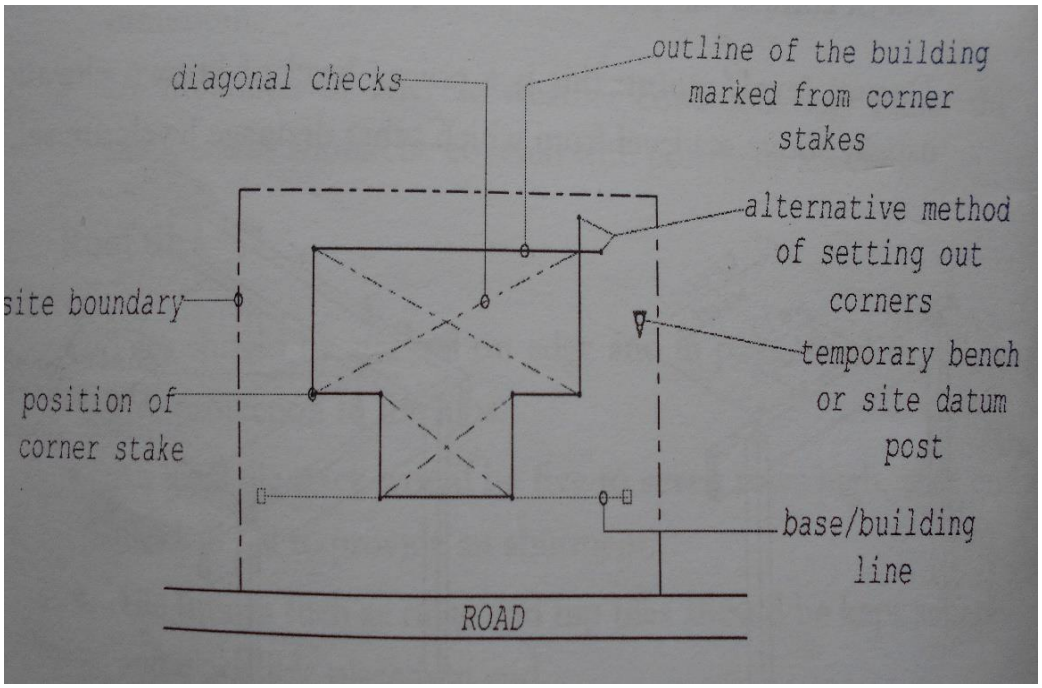

Figure 1

(i) Relationship between the road and the building line
(ii) Use of Temporally bench mark
(iii) Site boundary
(iv) Use of diagonals

(d) How do you understand by the word tracing out as related to setting out a building (2marks)

(e) List the tools used while setting out (2 marks)

(f) List out the materials used in setting out (2 marks)

(g) Mention methods/tools used to make perpendicularity during setting out. (3 marks)

Question four

(a) The drain of 30m is to be excavated at a gradient of 1:40. The invert level at the start of the drain at chainage 0.00 is given as 44.32m. If the bottom width of the trench is 900mm, calculate the volume of earth to be excavated when ground levels were taken as follows :- (10 marks)

Chain age (m)	Surface level (m)	Invert level (m)	Depth of excavation (m)
Height of instrument from ground (0.97m)			
BS (46.12m)			
0.00	45.60	44.42	
10	45.20		
20	45.11		
30	44.85		

(a) If the profile height from the ground level was 700mm above the ground level. Calculate the depth of the bonding rod (Traveler) to be used to control the excavation. (4 marks)

(b) Calculate the reduced levels of the profiles to be used at the chainages of 10m, 20m and 30m. (6 marks)

Question five

(a) Site investigations normally involves three basic stages namely desk study, walk -over survey and sub-soil survey.

Give a brief description of each of the stage and giving its importance. (10 marks)

(b) The following are the methods of site exploration:-

(i) Open excavation

(ii) Boring

(iii) Sub –surface sounding

(iv) Geo-Physical methods

Give a brief description of each these exploration method (10 marks)

Question six

(a) Describe the following types of drawings as used in construction

(i) Working drawing (4 marks)

(ii) Site layout (4 marks)

(iii) Structural drawing (4 marks)

(iv) Shop drawings (4 marks)

(V) Site location plan (4 marks)

SECTION B

Question Seven

(a) What do you understand by the word build environment? (2 marks)

(b) With aid of sketches give 4 illustration of man-made elements of built environment. (12 marks)

(c) List down six factors that man considers to design and construct a built environment (6 marks)

Question Eight

(a) By aid of sketches describe brick masonry retaining walls and anchored retaining walls (10 marks)

(b) With aid of sketches describe parameters of cantilevered retaining wall

(10 marks)

Question Nine

(a) What do you understand by the term diaphragm walling? (2 marks)

(b) Describe typical sequence of work using diaphragm walling (10 marks)

(c) What do you understand by the word bentonite slurry? Give reasons as to why bentonite slurry is used in diaphragm walling (4 marks)

(d) What is excavation? List the factors that affect the choice of the method of excavation. (4 marks)

Question ten

(a) List down the advantages and disadvantages of using mechanical plants in excavation

(6 marks)

(b) List down the differences between back actor and face shovel mechanical plants (6 marks)

(c) Explain how bull dozer operates in the field of excavation (8 marks)

Question Eleven

By use of sketches using French drains explain how land reclamation is done

Question Twelve

Risk assessment is a process that allows the contractor to put in place a proactive policy of managing work place risks. Hazard is a condition or object with the potential of causing injuries or death to personnel, damage to equipment or structures or loss of materials.

(a) Explain the steps of risk assessment process. (10marks)

(b) Explain the safety work cycle in a construction environment (10 marks)

End