INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF ENGINEERING

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BACHELOR OF CIVIL ENGINEERING

YEAR/SEM: YEAR 2/SEMESTER 1

COURSE CODE: BCE2105

NAME: CONCRETE TECHNOLOGY

DATE: 2025-04-24

TIME: 2:00-5:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully
2. The time allowed for this examination is STRICTLY three hours
3. Read each question carefully before you attempt and allocate your time equally between all the Sections
4. Write clearly and legibly. Illegible handwriting cannot be marked
5. Number the questions you have attempted
6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks
7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Choose two questions from this section

Question 1:

(a) Distinguish between initial and final setting of cement **(02 Marks)**

(ii) Discuss four types of cement used in construction industry **(04 Marks)**

(b) explain how cement is stored on a construction site **(04 Marks)**

(c) explain the wet process of manufacture of ordinary Portland cement **(05 Marks)**

(d) outline four constituents of raw materials used in the manufacture of ordinary Portland cement **(05 Marks)**

Question 2:

a) what is concrete **(02 Marks)**

b) Explain five properties of concrete (**10 Marks)**

c) Explain the disadvantages of using concrete as a building material **(04 Marks)**

d) Water used in concrete production should be safe for drinking , justify **(04 Marks)**

Question 3:

a) Outline **five** essential ingredients of concrete. (05 marks)

b) Explain **one** role played by each of the above ingredients in a concrete mix. (05 marks)

c) A homogeneous concrete mix plays an important role in the final strength of any concrete product. Describe **two** methods used in concrete mixing to achieve ahomogeneous mix. (06 marks)

d) Outline **four** precautions that must be taken while using one of the above methods.

(04 marks)

Question 4:

a) Define admixtures **(01 Mark)**

b) What are the four functions of admixtures in concrete production **(04 Marks)**

c) Discuss five physical properties of aggregates used in concrete production **(15 Marks)**

Section B Choose three questions from this section

Question 1:

a) Define Curing in relation to concrete technology. (02 marks)

b) List down any **four** Objectives of curing. (04 marks)

c) Different methods and procedures have been adopted for curing, explain **three** factors considered when choosing a certain method of curing concrete. (06 marks)

d) Describe any **four** methods of curing concrete. (08 marks)

Question 2:

(a) Define the term formwork as used in the construction industry**.** **(02 Marks)**

(b) Draw a neat illustration of the type of formwork suitable for building beams and label important members. **(07 Marks)**

(c) State five functional requirements of formwork.

(05 Marks)

(d) As a site foreman, identify the key points you would include in the formwork checklist used for inspection before concrete is cast. **(06 Marks)**

Question 3:

a) Outline **two** purposes of mixing water in concrete. (02 marks)

b) If water of unknown source is to be used, explain how to determine its acceptability.

(03 marks)

c) Discuss the effect of impure water when;

i. Producing concrete (03 marks)

ii. Washing aggregates (03 marks)

iii. Curing concrete. (03 marks)

d) Explain the effect that the following impurities have if present in mixing water.

i. Algae (02 marks)

ii. Oils (02 marks)

iii. Suspended solids (02 marks)

Question 4:

a) Define the term shrinkage as used in ceramics concrete works. (02 marks)

b) Outline **three** precautions undertaken when concreting under each of the following conditions;

i. Hot weather. (03 marks)

ii. Cold weather. (03 marks)

iii. Wet conditions. (03 marks)

With the aid of illustration, explain slump test as carried on fresh concrete giving its purpose (9 marks)