

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART I- SUPPLEMENTARY EXAMINATIONS – SEPTEMBER 2007

AAR 1104 – INTRODUCTION TO MATERIALS AND CONSTRUCTION I

AAR1108 - INTRODUCTION TO CONSTRUCTION MATERIALS I

Instructions

Time : 3 Hours

Answer ANY FOUR Questions.

All Questions Carry Equal Marks.

QUESTION 1

- a) Briefly explain the wet process in concrete preparation (7.5)
- b) Discuss the importance of compounds formed during the setting of cement that controls its setting time (7.5)
- c) Write brief notes on:
- (i) storage of cement at site (5)
 - (ii) properties of cement hence its use (5)

QUESTION 2

- a) Discuss the finess modulus method in concrete preparation. (10)
- b) A $0,02\text{m}^3$ sample of coarse aggregates is taken from its bulk storage and its mass was measured to be 1,6kg. The sample was then dried and its mass became 1,3kg. Fill in the soil phase diagram and determine the void ratio so as to determine the amount by volume of fine aggregates that should be mixed with $0,88\text{m}^3$ of these coarse aggregates. If the sand's void ratio is 0,3 calculate the amount of cement that should be added as well. Gs of course aggregate is 3,1 and that of sand is 2,6 while
- $s = w G_s$
 $w = 1000 \text{ kg/ m}^3$
- (10)
- c) Explain how workability of concrete can be measured by the slump test method. (5)

QUESTION 3

- a) Briefly write notes on:
- (i) precautions taken in using mortar. (5)
 - (ii) reasons why stones are losing their popularity as a building material. (5)
 - (iii) why it is necessary to wet bricks before mortar is applied. (5)
- b) How can one test the adhesiveness of mortar. (5)
- c) Discuss the bulking of sand and its effect on volumetric method in concrete mix. (5)

QUESTION 4

- a) State the purpose of seasoning timber. (5)
- b) Describe two methods of seasoning timber and compare them. (20)

QUESTION 5

- a) Describe the processes of manufacturing clay bricks. Use illustrations where possible. (20)
- b) Write brief notes on properties of clay bricks. (5)