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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2014/2015**

COURSE NAME : CIVIL ENGINEERING  
MATERIALS

COURSE CODE : BFC 10502

PROGRAMME : BACHELOR OF CIVIL  
ENGINEERING WITH HONOUR

EXAMINATION DATE : JUNE 2015/JULY 2015

DURATION : 2 HOURS

INSTRUCTION : ANSWER **FOUR (4)** QUESTIONS  
ONLY

THIS PAPER CONSISTS OF **FOUR (4)** PAGES

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- Q1**
- (a) List **THREE (3)** types of cement. (3 marks)
  - (b) Name the **TWO (2)** chemicals in cement that contribute to the early strength of concrete. (2 marks)
  - (c) A cement distributor is about to open a new branch at your place. You as an consultant engineer were given the task to design one new building to store the cement bags. Describe in details the cement storage room guidelines complete with storage room layout. (15 marks)
  - (d) Cement is the second highest producer of greenhouse gas known as carbon dioxide after automotive industry. Explain how this scenario happen. (5 marks)

- Q2**
- (a) List **TWO (2)** aggregates categories. (2 marks)
  - (b) Briefly explain aggregates Saturated Surface Dry (SSD) condition and its importance in concrete mixing. Describe the consequences of having aggregates in dry condition and fully saturated condition in concrete mix. (11 marks)
  - (c) Two main sources of aggregates are from sea/river shore gravel and quarry. Describe **ONE (1)** advantage and **ONE (1)** disadvantage of using aggregates from both sources. (8 marks)
  - (d) Describe the main purpose of the following tests.
    - (i) Sieve analysis
    - (ii) Los Angeles abrasion test
    - (iii) Compression test
    - (iv) Absorption test(4 marks)

- Q3**
- (a) List **THREE (3)** main components of concrete. (3 marks)
  - (b) Briefly explain pre-cast concrete and in-situ concrete. (4 marks)

- (c) Briefly describe **TWO (2)** tests for the following conditions:
- (i) Fresh concrete test
  - (ii) Destructive hardened concrete test
  - (iii) Non-destructive hardened concrete test
- (18 marks)
- Q4** (a) List **THREE (3)** types of bricks. (3 marks)
- (b) Clay brick can be classified into four categories. Briefly describe all the clay brick classifications. (12 marks)
- (c) Briefly describe the manufacturing of calcium silicate blocks. (6 marks)
- (d) You are assigned to modify a ready-made house. Scope of the work is to build a temporary storage for construction equipment and wall to support kitchen appliances. Propose a brick bonding arrangement for both purposes. (4 marks)
- Q5** (a) Define wood, lumber and timber. (3 marks)
- (b) Explain the following timber products:
- (i) Veneers
  - (ii) Plywood
  - (iii) Boards
- (6 marks)
- (c) Briefly describe the following:
- (i) Heavy hard wood
  - (ii) Medium hard wood
  - (iii) Softwood
- (6 marks)
- (d) With the aid of sketches, describe **THREE (3)** natural defects of wood. (6 marks)

- (e) As a timber salesman, propose **TWO (2)** types of wood for furniture and bridge construction. (4 marks)

**Q6** (a) List **THREE (3)** classifications of steel. (3 marks)

(b) List of **TWO (2)** types of steel connection. (2 marks)

(c) List **TWO (2)** main advantages and **Two (2)** disadvantages of using steel as construction materials? (4 marks)

(d) Describe in details the manufacturing of steel. (10 marks)

(e) Briefly describe the usage of carbon fibre polymer sheet and carbon polymer bar in concrete. (6 marks)

**-END OF QUESTION-**