

CONFIDENTIAL



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2016/2017**

TERBUKA

COURSE NAME : CIVIL ENGINEERING MATERIALS
COURSE CODE : BFC10502
PROGRAMME CODE : BFF
EXAMINATION DATE : DECEMBER 2016 / JANUARY 2017
DURATION : 2 HOURS
INSTRUCTION : ANSWER **TWO (2)** QUESTIONS IN **SECTION A**, AND **TWO (2)** QUESTIONS IN **SECTION B**.

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

CONFIDENTIAL

SECTION A:

- Q1**
- (a) State **FIVE (5)** differences between concrete design using DOE and ACI methods. (10 marks)
 - (b) Sketch and label the slump test apparatus to determine concrete workability. (6 marks)
 - (c) List **THREE (3)** admixtures usually used in concrete. (3 marks)
 - (d) Describe **THREE (3)** methods of concrete curing. (6 marks)
- Q2**
- (a) Define the fineness modulus. Give the practical range of fineness modulus values for coarse and fine aggregates. (5 marks)
 - (b) The aggregate has pores in which water can be held for a long time. With aid of illustration, explain the following aggregate state of conditions:
 - (i) Bone dry (4 marks)
 - (ii) Air dry (4 marks)
 - (iii) Saturated surface-dry (4 marks)
 - (iv) Moist (4 marks)
 - (c) Explain the effect of the shape and texture of aggregates on the strength and workability of concrete. (4 marks)
 - (d) Describe the importance of sieve analysis in determining particle size distribution. (4 marks)

SECTION B:

- Q1** (a) Define timber and give the names of **FOUR (4)** common varieties of Malaysian timber. (5 marks)
- (b) Draw the typical cross-section of a timber log. (5 marks)
- (c) With aid of sketches, explain **THREE (3)** types of defects in timber. (6 marks)
- (d) Describe fibre saturation point and explain how moisture content would affect the strength and durability of timber. (9 marks)

TERBUKA

- Q2** (a) Define the masonry and state the common masonry units used in construction. (5 marks)
- (b) State the important properties of brick that are considered in structural applications. (5 marks)
- (c) Simply discuss **THREE (3)** important factors of mortar that should be used in masonry construction. (6 marks)
- (d) With the aid of sketches, list out the application of steel in structural concrete. (9 marks)
- Q3** (a) List **THREE (3)** non-ferrous metals used in construction. (3 marks)
- (b) Define and describe types of glasses. (6 marks)
- (c) Describe the properties and function of aluminium as a material of construction. (7 marks)
- (d) Define ferro cement and discuss the various applications of ferro cement in the construction sector of Malaysia. (9 marks)

– END OF QUESTIONS –