Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014

COURSE NAME	:	CIVIL ENGINEERING MATERIALS
COURSE CODE	:	BFC10502
PROGRAMME	:	1 BFF
EXAMINATION DATE	:	JUNE 2014
DURATION	:	2 HOURS
INSTRUCTIONS	:	ANSWER **FOUR (4)** QUESTIONS ONLY

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

Q1 (a) Prepare infographics on cement chemistry and production.

(5 marks)

(b) Sketch and label the Vicat apparatus, describe method, tabulate materials used and present typical test results with a sketch of graph.

(10 marks)

(c) Illustrate with a flow chart the development of a biomass silica blended cement for waterproofing applications.

(10 marks)

Q2 (a) Estimate the global demand of aggregate based on annual concrete production.

(5 marks)

(b) Illustrate a field adjustment calculation for concrete with fine aggregate content of 800 kg/m^3 and water content of 160 kg/m^3 if the free water on fine aggregate is 5%.

(10 marks)

(c) Explain the effect of aggregate packing efficiency on the strength of concrete.

(10 marks)

Q3 (a) Sketch and label the slump test apparatus to determine concrete workability.

(5 marks)

(b) Explain briefly the importance of concrete compaction and the advantages of self-compacting concrete.

(10 marks)

(c) Tabulate mix proportion for grade 60 concrete in accordance with the concept of design for durability.

(10 marks)

Q4 (a) Prepare infographics on the production of lightweight concrete masonry block for affordable home.

(5 marks)

(b) Specify mix proportion to produce 1 m^3 of masonry which comprises 105 pieces of masonry blocks of size 100 mm x 200 mm x 460 mm.

(10 marks)

(c) Specify the engineering properties of the masonry block related to density, strength, shrinkage, water absorption, fire resistance, thermal insulation and sound transmission loss for a budget hotel project.

(10 marks)

Q5 (a) Explain briefly the seasoning of timber.

(5 marks)

(b) Describe briefly the reuse of timber waste in the tropics.

(10 marks)

(c) Explain the structural use of timber for sustainable construction.

(10 marks)

Q6 (a) Sketch stress-strain curve and state values of tensile strength of mild steel, high tensile steel and prestressed tendon.

(5 marks)

(b) Explain briefly the use of steel as system formwork in construction.

(10 marks)

(c) Propose the use of glass fibre reinforced polymer as alternative to steel in prestressed concrete elements for coastal erosion mitigation.

(10 marks)

- END OF QUESTION -