



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : CIVIL ENGINEERING MATERIAL
COURSE CODE : DAB 10202
CO-HORT : 1 DAB
EXAMINATION DATE : DECEMBER 2013/ JANUARY 2014
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : ANSWER ANY FIVE (5) QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

- Q1**
- (a) Describe **the two (2)** basic raw ingredients for manufactured cement. (4 marks)
 - (b) Describe the properties of low heat portland cement. (4 marks)
 - (c) Explain the formation of silica fume and its characteristics. (4 marks)
 - (d) Sketch and explain the transmission of tensile and compressive characteristics of aggregates. (8 marks)
- Q2**
- (a) Calculate the porosity of coarse aggregates if the water absorption is 5.5% and the specific gravity of the aggregate is 2.73. (3 marks)
 - (b) Calculate the void content if given the value of aggregates specific gravity is 2.75, density of water is 1000kg/m^3 and the bulk density of aggregates taken as 1745 kg/m^3 . (3 marks)
 - (c) A sample of coarse aggregates in moist condition found to be 8.65 kg (with tray) and the dry weight after 24 hours in oven was 8.16 kg (with tray). The weight of the tray is 1.5 kg.
Calculate the moisture content of the sample (4 marks)
 - (d) **Table 1** shows the result of sieve analysis on a sample of aggregates.
 - (i) Calculate the percent retain
 - (ii) Calculate the percent passing
 - (iii) Plot the size distribution curve(10 marks)

- Q3**
- (a) Name **four (4)** factors that affect the workability of concrete
Factors that affect the workability of concrete are; (4 marks)
 - (b) Define the mobility of fresh concrete (2 marks)
 - (c) Several factors influence the strength of concrete. List **two (2)** methods that depending on testing method and **two (2)** methods that independent on testing method. (4 marks)
 - (d) Describe with sketching the procedures of slump test (8 marks)
 - (e) Calculate the tensile strength by splitting test on cylinder with diameter of 150 mm and 300 mm long. The failure load is 65 kN/m^2 . (2 marks)
- Q4**
- (a) Sketch and explain the deformation under load curve for hardened concrete with the major axes of deformation versus time. (9 marks)
 - (b) The following are several types of concrete, Choose **one (1)** and describe briefly.
 - (i) Reinforced Cement Concrete
 - (ii) Prestressed Concrete
 - (iii) Polymer Concrete(5 marks)
 - (c) Describe in detail facing brick (2 marks)
 - (d) Sketch flemmish bond for **five (5)** layers of bricks, show the location of Headers. (4 marks)

- Q5**
- (a) Define compressive strength of a clay brick unit and factors that influence the strength. (4 marks)
 - (b) A dry brick weighs 8.52 kg was submerged for 24 hrs and weighs 9.48 kg. Calculate the percent absorption of the brick. (2 marks)
 - (c) Hardwood is normally expensive in market, list **three (3)** of their properties. Give **one (1)** example from each temperate and tropical species (4 marks)
 - (d) Describe the procedures for calculating shrinkage or swelling of timber. (7 marks)
 - (e) Name **three (3)** steps to prevent fungi (3 marks)
- Q6**
- (a) Define 'ladle' in the production of steel (1 mark)
 - (b) List **two (2)** advantages of basic oxygen steelmaking or LD-converter (4 marks)
 - (c) The following are the usage of steel in construction, choose one (1) and discuss with appropriate sketches.
 - (i) Framed structure
 - (ii) Shell-type structure
 - (iii) Suspension-type structure(6 marks)
 - (d) Sketch and label the gypsum board used as partition wall. (6 marks)
 - (e) Define pozzolan (3 marks)

END OF QUESTION

FINAL EXAMINATION

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LIST OF FORMULA :

$$\text{Porosity} = \frac{100 \times W \times G_s}{(100 + W)} ; \quad \text{Voidcontent} = \frac{SGW - B}{SG \times W} \times 100 ; \quad MC = \frac{\text{weightofmoisture}}{\text{ovendryweight}} \times 100\%$$

$$f_t = \frac{2W}{\pi DL} ;$$

Table 1 : The result of sieve analysis for aggregate

Sieve	Mass Retained (kg)	% Retained	% Passing
25	110		
19	327		
12.5	1321		
9.5	1970		
4.75	1422		
2.3	270		
1.18	76		
Pan	64		
Total	5560		