



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER 1
SESSION 2016/2017**

COURSE NAME : STRUCTURAL MAINTENANCE
COURSE CODE : BNC 40603
PROGRAMME : 4 BNC
DATE : DECEMBER 2016 /
JANUARY 2017
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : ANSWER ALL QUESTIONS

TERBUKA

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

- Q1** (a) Evaluate the possibility of the building after fire impact whether to demolish or repair. (6 marks)
- (b) Explain how to repair the building defects due to fire hazard. (4 marks)
- (c) The excessive settlement of soil will impact to the structure.
- Analyze the defect to building due to this cause
- Select the suitable method to repair the building due to this excessive settlement. (8 marks)
- (d) To protect rc structures on particular zone, need special protection to rc concrete. Analyze the special precaution to protect the concrete in the following prone area of :
1. Fertilizer industry
2. Offshore and seashore
3. Waste water treatment plant
4. Arid / desert (4 marks)
- (e) With the aid of sketch, Explain the **three (3)** main causes of structural defects. (3 marks)
- Q2** (a) Evaluate the effectiveness of stitching and dowelling to repair the defects of concrete slab with dormant crack. (6 marks)
- (b) To protect building from foundation problems, explain **four (4)** recommendations what should you do in the perimeter area of the building. (4 marks)
- (c) Roof of building needs maintenance, explain the concept to protect roof structure. (5 marks)
- (d) With the aid of sketch, Differentiate the strengthening and stabilizing in repairing RC structures (5 marks)
- (e) Analyze the process of carbonation, alkali aggregate reaction and chloric acid attack to certain thickness of concrete. (5 marks)
- Q3** (a) Describe **three (3)** reasons why we need to monitor the structures after being repaired, (3 marks)
- (b) Explain the lab and field test in monitoring the structures after reparation work. (3 marks)

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(c) Among of this **three (3)** material : Epoxy resin polyester resin and elastomer, Analyze and select the most proper to repair structural active crack of beam. (3 marks)

(d) Compare the behaviour of live and dormant crack (4 marks)

(e) Fill in the blank in the table

No	Name of defects	Potential Location	Origin/Cause	Structural/ Non Structural	Remarks
Concrete / mortar					
1.	Staining on wall	.....	.....	.....
2.	Crack on wall	.....	.....	.....
3	Rendering	.....	.....	.....
4	Concrete spalling due to rebar corrosion				
Wood					
1.	Insect attack	.....	.....	.....

(12 marks)

Q4 (a) Explain **three (3)** reasons of the need to do visual inspection before some further action carried out. (3 marks)

(b) Discuss the output result from Rebound hammer test and Half cell electrical potential method (6 marks)

(c) Geophysical method can be used to detect and observe the properties of building component, Analyze the effectiveness of the NDT equipment which utilized this concept. (6 marks)

(d) Analyze **five (5)** reasons why we need maintenance of building. (5 marks)

(e) Set up the maintenance program of 10 stories office high rise building (5 marks)



- END OF QUESTIONS -