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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020**

COURSE NAME : BUILDING FORENSIC
TECHNOLOGY

COURSE CODE : BNC 41203

PROGRAMME CODE : BNC

EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

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

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- Q1** (a) Inspection of a building damage can be as simple as a recording visual condition of the structure or more complicated one, such as a forensic study of an incident or catastrophe in order to find out about the origin and nature of deterioration and degradation. Describe the steps in the assessment procedure for evaluate damages in a building. (15 marks)
- (b) Structural cracks deserve immediate attention. They indicate that the structure of the building, or at least a part of it, is overstressed. A structure, when stresses beyond its capacity, may collapse without further warning signs. As a building professional, suggest the **FIVE (5)** steps to be taken when such cracks suddenly develop, or appear to widen or to spread. (10 marks)
- Q2** (a) Describe the purpose of forensic engineering investigation. (3 marks)
- (b) Briefly explain the importance and need of non-destructive testing. (6 marks)
- (c) Structural failures are not just accidents, nor acts of God. Commonly, they are the results of human error originating from oversight, carelessness, ignorance or greed. Therefore, you are required to demonstrate the investigation process stage-by-stage to find out the factors that lead to building collapse or structural failure. (8 marks)
- (d) On October 19, 2018, a five-storey shopping mall at Shah Alam collapsed due to the inability of a component and structure to perform its intended function. As a building forensic expert, analyze **TWO (2)** non-destructive tests that can be used to check the condition of concrete and reinforcement, respectively. (8 marks)

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- Q3** (a) The successful of design and building depends on the foundation design, total load and soil load bearing capacity. Differentiate between shallow foundation and deep foundation. (6 marks)
- (b) Non uniform soil movement will lead to differential settlement of a foundation and it can result in serious crack to the structure constructed over them. Repair the crack due to a continuing foundation settlement will no use until the settlement problem is corrected. As a engineering technologist, recommend the proper methods to stabilize the foundation. (6 marks)
- (c) With aid of diagram, demonstrate **THREE (3)** types of cracking on column. (9 marks)
- (d) Describe **FOUR (4)** causes of structural crack. (4 marks)
- Q4** (a) Describe about Building Maintenance definition. (3 marks)
- (b) Explain **THREE (3)** purpose of building maintenance plan. (6 marks)
- (c) Maintenance is one of the process to ensure the buildings and other assets retain a good appearance and operate at optimum efficiency. Classify the types of maintenance based on BS 3811. (8 marks)
- (d) Analyze **FOUR (4)** factors that influence the effectiveness of maintenance cost with maintaining the functions of the building. (8 marks)

TERBUKA**-END OF QUESTIONS-**