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Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2017/2018**

COURSE NAME : BUILDING MAINTENANCE  
COURSE CODE : BFB40903  
PROGRAMME CODE : BFF  
EXAMINATION DATE : DECEMBER 2017 / JANUARY 2018  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

**TERBUKA**

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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- Q1** Heritage buildings are valuable and should be appreciated for its cultural significance. The nature of heritage buildings, which are in some avoidable degree of degradation and decay, maintenance is the most significant approach that can ensure the prolongation of the building's lifespan. The lack of maintenance by the authorities and occupants of these buildings often leads to reduced building's lifespan.
- (a) Explain with an example on **FIVE (5)** factors of building principle that have influence on lifespan of the heritage buildings. (10 marks)
- (b) Discuss with an example the principal work on building conservation for the roof element of heritage building according to National Heritage Act 2005 (Act 645). (5 marks)
- Q2** Condition assessment is based on the qualification and quantification of defects in building and system components. It is the first step towards achieving good maintenance management. The type and extent of maintenance work required to restore the fabric, element or building to the desired standard should form an integral part of the condition assessment exercise. Based on your understanding, explain with an example the commonly used condition ratings for describing the existing condition of a building or facilities. (15 marks)
- Q3** A road will be constructed at Simpang Dua, Segamat, Johore with a limited budget from the government. There are two types of material alternative for the road construction. The **TABLE Q3** shows the cost for the entire span of both types of materials. Evaluate which types of construction are economical to be constructed. (15 marks)

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- Q4** (a) Building defects are very common phenomena in any kind of construction. Building defects arise through inappropriate or poor design, specification and construction as well as insufficient attention given to building maintenance. Explain **TWO (2)** types of defects and causes that commonly occur in the building that have been occupied more than 5 years. (8 marks)
- (b) Defects and damages are common problems encountered in any building regardless of the age of the building. A systematic inspection system is necessary to address the defects problem and this inspection system will provide a diagnostic level to the problem of the building and will be referred to the Structure and Civil, Mechanical and Electrical Forensic Experts for proposed repairs. Elaborate with an example the method of conducting visual inspections and assessment of building conditions by the Public Works Department to inspect the government buildings. (7 marks)

- Q5** (a) The maintenance department is a part of the Local Municipal Organization. Explain with an example the scope of works of the Department of Maintenance at the Local Municipal. (5 marks)
- (b) The Building Maintenance Manual is a reference document which contains clear procedures, information on department functions, objectives and activities involved in building maintenance project. This document is the main reference that will help the Department and staff to carry out their respective duties more efficiently and in an orderly manner. Based on your understanding, elaborate the process of maintenance work for repairing damages to buildings owned by the Local Municipal for the maintenance value exceeds RM50,000. (10 marks)
- Q6** (a) The maintenance program is a maintenance work plan whether to prevent, maintain or repair over a lifetime of a building. Maintenance work can be controlled based on the maintenance program. Differentiate with an example, types of maintenance program for short term maintenance, midterm maintenance and long term maintenance for the Faculty of Civil and Environmental Engineering (FKAAS) building. (10 marks)
- (b) Supervision of maintenance work is important to ensure that maintenance works are delivered by contractors in accordance with the terms and standards specified in maintenance contracts. Construct a flow chart to explain how maintenance work supervision by the contractors is implemented. (8 marks)
- (c) Building inspections are important in ensuring operational requirements and maintenance, evaluation, rehabilitation, renovation and upgrade, and disposal can be implemented easily and effectively. Based on the Guideline of Inspection and Condition Assessment, JKR 21602, explain the inspection implementation process of existing buildings. (7 marks)

– END OF QUESTIONS –

**TERBUKA**

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**TABLE Q3**

<b>Alternative 1</b>	<b>Portland Cement Concrete Pavement</b>
Initial construction cost	RM 3,600,000
Sealed transverse joints	RM 123,000 (at Year 10 and Year 20)
Schedule maintenance	RM 54,000
Residual value	RM 840,000
Expected life	30 years
Discount rate	4%
<b>Alternative 2</b>	<b>Hot-Mix Asphalt</b>
Initial construction cost	RM 2,700,000
Phase 2 Construction (Year 10)	RM 1,050,000
Pavement Cycle (Year 20)	RM 870,000
Scheduled maintenance	RM 3,000 per annum
Residue value	RM 840,000
Expected life	30 years
Discount rate	4%

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