UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	STRUCTURAL MAINTENANCE
COURSE CODE	:	BNC 41103
PROGRAMME CODE	:	BNC
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1   (a)   Describe briefly the definition of structural.

(5 marks)

(b)   Briefly about Imposed Load

(2 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)   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.

(10 marks)

Q2   (a)   Rebound hammer and ultrasonic pulse velocity are commonly investigation method for structural defects that will be used in the construction industry. Give **TWO (2)** similarities of this test.

(2 marks)

(b)   Range and limitations of Schmidt Rebound Hammer test can affected by many factors. Point out the factors that can influence the testing result in rebound hammer test.

(7 marks)

(c)   In Ultrasonic Pulse Velocity test, a pulse of longitudinal vibrations is produced by an electro-acoustical transducer, which is held in contact with one surface of the concrete under test.

(i)   Classify **THREE (3)** types of arrangement transducer.

(3 marks)

(ii)   From answer in **Q2 (c) (i)**, sketch each type of arrangement transducer.

(6 marks)

(d)   List **SEVEN (7)** purposes of Non-destructive Test (NDT) commonly apply in Malaysia construction industry.

(7 marks)

Q3   (a)   Building defect is one of the major component of building problem that significantly needed attention. Analyse common defect and deterioration of concrete structures.

(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, create the procedure of foundation stabilization by mudjacking.

(9 marks)

(d)   Investigate TWO (2) causes of failure foundation.

(4 marks)

Q4   (a)   Construct FIVE (5) steps for an engineer to properly assess a structure's condition to determine best solution in inspection and investigation..

(10 marks)

(b)   Application in Figure Q4 (a) make it easy for engineers and construction foremen to make immediate decisions.

(i)   Give the name of this application.

(1 marks)

(ii)   Explain the function of the application as per mentioned in Q4 (a) (i).

(1 marks)

(c)   Name the tools A, B and C as per indicated in Figure Q4 (b).

(3 marks)

(d)   A civil engineer often at the construction site itself, taking a hands-on approach to engineering tasks. Analyse the problem solution for A, B, C, D, and E as in Figure Q4 (c).

(10 marks)

-END OF QUESTIONS –

TERBUKA

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Figure Q4 (a)
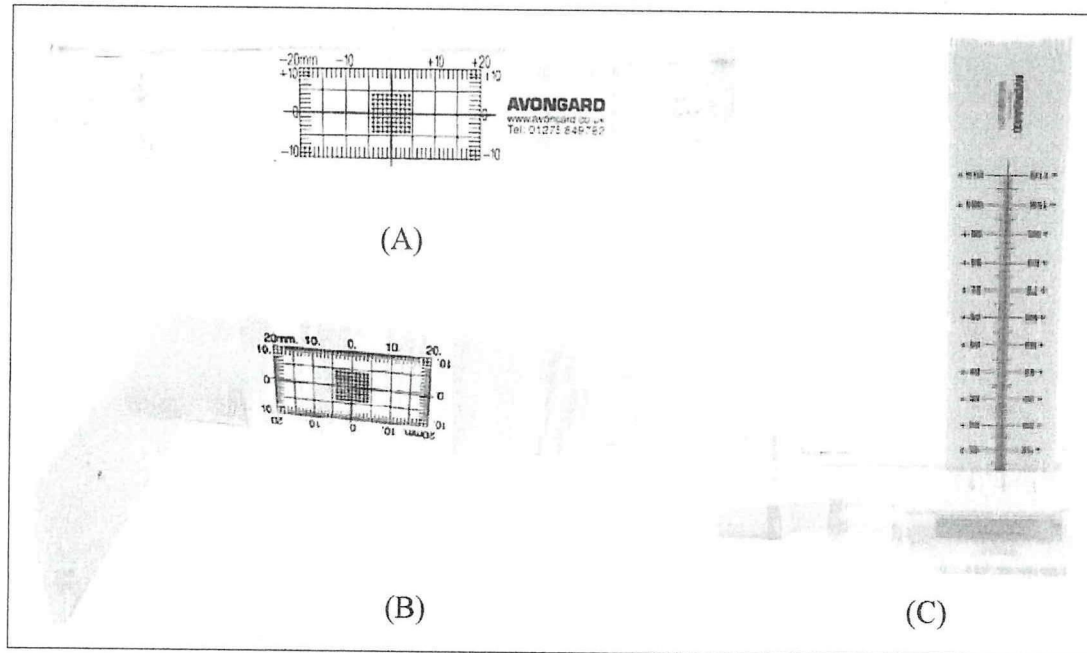
(A)

(B)
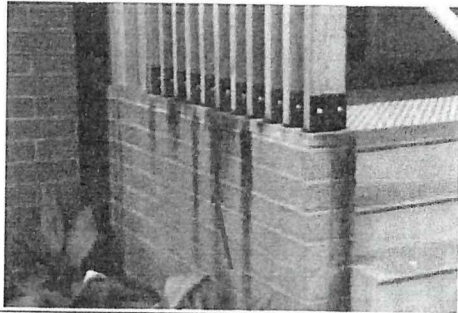
(C)

Figure Q4 (b)

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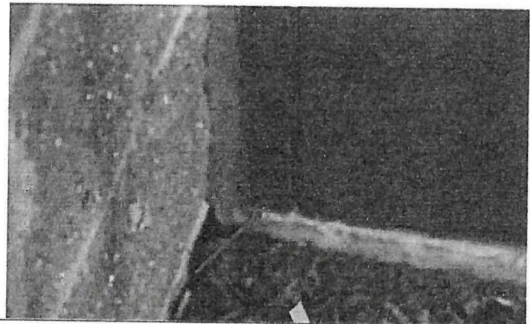COURSE NAME   : STRUCTURAL MAINTENANCE   COURSE CODE   : BNC 4

Situation A Finding:
Brown stains are running down blockwork wall from the timber feature panels.
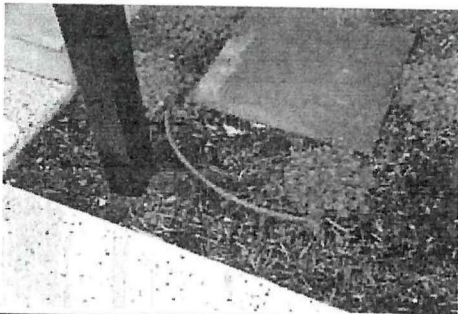

Situation B Finding:
Door frame to electrical meters has 1 hole visible at the lower section of the frame.
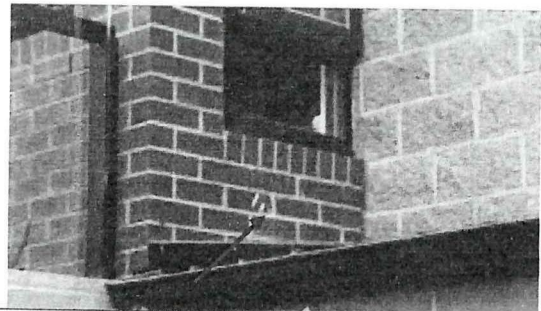

Situation C Finding:
Unsatisfactory installation of sprinkler system in garden bed.

Situation D Finding:
Paint splatter to brickwork is evident underneath window.

Situation E Finding:
Water is entering the carpark block wall via non-waterproofed garden bed causing efflorescence on the block work in the carpark.

Figure Q4 (c)