CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR

Malaysia France Institute

FINAL EXAMINATION

SEPTEMBER 2013 SESSION

SUBJECT CODE	:	**FTB 43203**
SUBJECT TITLE	:	**FAILURE ANALYSIS**
LEVEL	:	**BACHELOR**
TIME / DURATION	:	**2.5 HOURS**
DATE	:	

INSTRUCTION TO CANDIDATES

1. **Please read the instructions given in the question paper CAREFULLY.**
2. **This question paper is printed on both sides of the paper.**
3. **Please write your answers on the answer booklet provided.**
4. **Answer should be written in blue or black ink except for sketching, graphic and Illustration.**
5. **This question paper consists of FIVE (5) questions. Answer FOUR (4) questions only.**
6. **Answer all questions in English.**

THERE ARE THREE (3) PAGES IN THIS QUESTION PAPER

INSTRUCTION: Answer FOUR (4) questions only.

Please use answer booklet provided.

Question 1

(a). Define what is "FAILURE".

(5 Marks)

b). What are the **THREE (3)** factors that are normally considered the contribution to failures. Please explain and gives examples each.

(10 Marks)

(b). Explain what is galvanic corrosion, crevice corrosion, uniform corrosion and stress corrosion cracking

(10 Marks)

Question 2

(a). "BUCKLING" is one form of distortion failures. Define and explain what is buckling and gives examples.

(10 Marks)

(b). Define what is CATASTROPHIC failure.

(5 Marks)

(c). In relation to fracture mechanics please describe the following;

i. The **THREE (3)** modes of failures

ii, Stress Intensity (*k*) of material

iii. Fracture Toughness

(10 Marks)

Question 3

(a). What are WEAR Failures. State the difference between ABRASIVE and ADHESIVE failures and gives examples.

(10 Marks)

(b). What are BRITTLE and DUCTILE Fractures and how it was identified.

(10 Marks)

(c). Define what is DISTORTION FAILURES and gives an example

(5 Marks)

Question 4

(a). Describe what is FRETTING wear and explain the **FIVE (05)** methods to reduce the wear.

(10 Marks)

(b). The possible causes of failures shown in **Figure 1** below are material and welding defects. Please

describe the steps that may derive to the above conclusions.

Figure 1

(15 Marks)

Question 5

(a). Describe in detail the steps (general practices) in undertaking failure investigation and analysis.

(15 Marks)

(b). Describe what is Structural Integrity Assessment and Risk Based Inspection.

(10 Marks)

END OF QUESTIONS