



**UNIVERSITI KUALA LUMPUR**  
**Malaysia France Institute**

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**FINAL EXAMINATION**  
**SEPTEMBER 2014 SESSION**

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**SUBJECT CODE** : FWB24103  
**SUBJECT TITLE** : WELD INSPECTION TECHNIQUE  
**LEVEL** : BACHELOR  
**TIME / DURATION** : 8.00 PM – 10.30 PM  
( 2.5 HOURS )  
**DATE** : 9 JANUARY 2015

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**INSTRUCTIONS TO CANDIDATES**

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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 **TWO (2)** sections. Answer all questions in Section A and Section B.
  6. The ISO 5817 standard will be provided and should be returned after the exam.
  7. Answer all questions in English.
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**THERE ARE 8 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A (Total: 40 marks)****INSTRUCTION: Answers All Questions.****Questions 1**

Destructive testing is an important activity in identifying weld integrity:

1.1 Explain what you know about “**destructive testing**”. (7 marks)

1.2 Why is Destructive Testing important? (8 marks)

**Questions 2**

Non destructive testing is an important activity in identifying weld integrity:

2.1 Explain what you know about “**non-destructive testing**”. (7 marks)

2.2 Why is non destructive testing important? (8 marks)

**Questions 3**

In **Liquid (Dye) Penetrant testing**, you will come across the term “**Dwell time**”. What is it? (10 marks)

**SECTION B (Total: 60 marks)**

**ANSWER ALL QUESTIONS. Use Appendices 2 & 3 to Answer Questions 3 & 4 in Section B.**

**Question 1**

Liquid dye penetrant testing is a non destructive testing method:

1.1 Explain briefly about “Liquid (Dye) Penetrant Testing (PT)” and (5 marks)

1.2 What are its main purpose, importance and limitations? (5 marks)

**Question 2**

Mechanical testing is used to identify weld integrity:

2.1 Explain briefly about the “**Root and Side Bend Tests**” and (5 marks)

2.2 What are its main purpose, importance and limitations? (5 marks)

**Question 3**

**Appendix 1** below shows a photo of a “**Macro Sample ID AM1034**”. It is a 10X magnification from the actual sample.

- 3.1 Identify visible defects/imperfections on the macro sample and plot in the Macro report sheet in **Appendix 2**.
  - 3.2 Number the defects/imperfections found in the Macro sample on the macro report sheet in **Appendix 2**.
  - 3.3 Measure and size the defects/imperfections found on the Macro report sheet in **Appendix 2**.
  - 3.4 Sentence the defects/imperfections in accordance to **ISO 5817 (Stringent)**. The ISO 5817 is provided.
  - 3.5 A comment on the defects/imperfections and on the condition of the specimen is imperative.
- (20 marks)

**Question 4**

**Photo 1** below shows a Tee Joint specimen with a single sided fillet weld. Please read carefully the instructions below in order to conduct the visual inspection as per **Appendix 1** and to comply with the **ISO 5817 requirement**.



**Photo 1 – Tee Fillet Joint**

**General Information:-**

- (a) Specimen No.: FW122
- (b) Material Type: carbon manganese steel
- (c) Material Thickness: 12.0 mm X 300 mm
- (d) Material size: 100 mm X 300 mm
- (e) Welding process: 111
- (f) Welding position: PB

**Weld Information:**

- (a) Vertical plate maximum weld height measured: 12.0 mm
- (b) Vertical plate minimum weld height measured: 9.0 mm
- (c) Horizontal plate maximum weld height measured: 10.0 mm
- (d) Horizontal plate minimum weld height measured: 9.5 mm
- (e) Throat maximum weld depth measured: 9.5 mm
- (f) Throat minimum weld depth measured: 8.0 mm

**Information on Defects/Imperfections:**

- (a) Toe undercut: 1.5 mm D X 50.0 mm L
- (b) Poor stop start (Overlap): 2.5 mm D X 20.0 mm L
- (c) Crater depression: 1.0 mm D X 15.0 mm L
- (d) Grinding marks: Area 30.0 mm X 30.0 mm
- (e) Chipping marks: Area 30.0 mm X 30.0 mm
- (f) Stray arc: Area 25.0 mm X 30.0 mm
- (g) Stray arc: Area 30.0 mm X 20.0 mm
- (h) Surface Porosity: Area 10.0 mm X 10.0 mm
- (i) Slag: 1.0 mm D X 10 mm L
- (j) Spatter: Area 20.0 X 20.0 mm
- (k) Scales: Area 15.0 mm X 30.0 mm

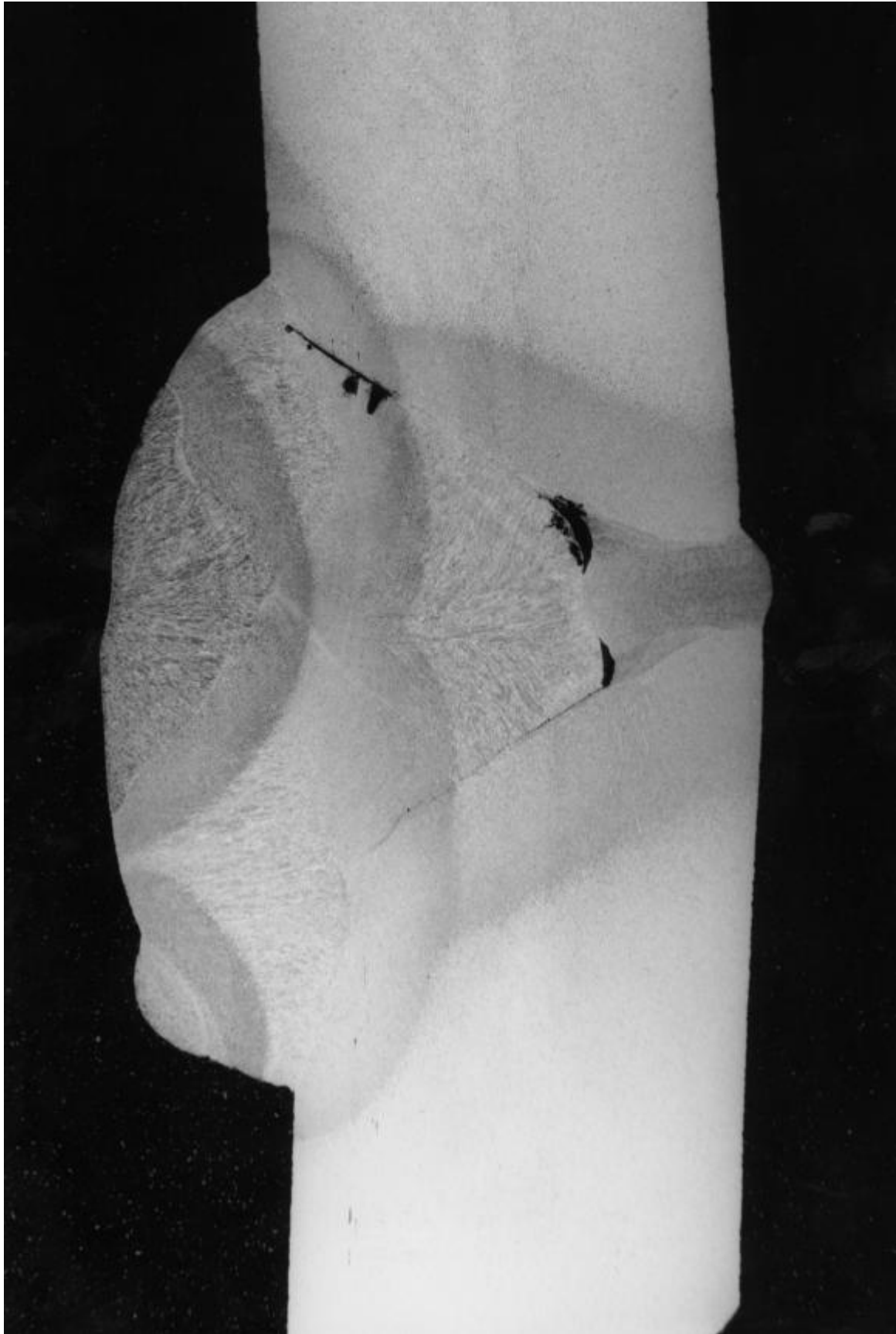
**By using Appendix 3, your tasks shall be to identify the following:-**

- 4.1 Measure and record as required in **Appendix 3**;
- 4.2 Sentence the fillet weld dimensions in accordance to the design criteria as required in Appendix 3;
- 4.3 Report the defects/imperfections as required in **Appendix 3**;
- 4.4 Record defects/imperfections according to its length, depth and height as required in **Appendix 3**;
- 4.5 Sentencing of all visible defects should be in accordance to **ISO 5817 “Moderate” category (provided)**;
- 4.6 Your overall assessment as required in **Appendix 3**;
- 4.7 Sign and print your name as required in **Appendix 3**;
- 4.8 Your remarks and recommendations as required in **Appendix 3**.

(20 marks)

**END OF QUESTION**

Appendix 1



Macro Specimen ID AM1034

Appendix 2

**MACRO INSTRUCTION/REPORT SHEET [ID: AM1034]**

**CHECK PHOTOGRAPH ID MATCHES THIS REPORT ID  
ALL DEFECTS TO BE REPORTED [AND SIZED IF REQUIRED]  
THEN SENTENCED TO ISO 5817 LEVEL B [STRINGENT]**

**NOTE: PHOTOGRAPH IS AT X10 MAGNIFICATION  
MATERIAL: LOW CARBON MANGANESE STEEL  
WELDING PROCESS: [MMA/SMAW/111]**



No.	DEFECT	SIZE	ACCEPT/REJECT
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11	Excess weld metal		
12	Excess penetration		

**Comments:**

.....  
 .....  
 .....

**Signature:** .....

**Date:** .....

**Print Full Name:** .....





