



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

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**FINAL EXAMINATION**

**SEPTEMBER 2014 SESSION**

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**SUBJECT CODE** : FWD32503  
**SUBJECT TITLE** : WELDING INSPECTION AND TESTING  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 9.00 AM – 11.30 AM  
( 2.5 HOURS )  
**DATE** : 07 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 **FOUR (4) Questions in Section A and TWO (2) Questions in Section B. Answer THREE (3) Questions from Section A and ALL Questions from Section B.**
  6. Answer all questions in English.
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**THERE ARE 3 PAGES OF QUESTIONS EXCLUDING THIS PAGE, 1 CODE BOOK AND 1 ATTACHMENT**

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**Section A****INSTRUCTION: Answer THREE (3) from FOUR (4) Questions.****(60 Marks)****Please use the answer booklet provided.****Question 1**

- a). Name the recommended codes for the following;
- i. Design and construction of welded structures
  - ii. Design and construction of Unfired Pressure vessels
  - iii. Design and construction of Pipelines
- (5 marks)
- b). List the necessary requirements to be determined prior to starting an inspection
- (5 Marks)
- c). List the essential items for Inspection and Test Plan (ITP). Referring to Attachment Drawing No: ABC-123, develop an ITP for the construction of the vessel.
- (10 Marks)

**Question 2**

- (a) What is the purpose of Hydro test?
- (5 Marks)
- (b) List the essential requirements for hydro test and the inspection during testing.
- (5 Marks)
- (c) List and describe briefly any **TWO (2)** types of Destructive tests for Welders Qualification Test and **TWO (2)** types for material tests.
- (10 marks)

**Question 3**

- (a). List the objectives of inspection.
- (5 Marks)
- (b). List out **THREE (3)** tools for visual inspection.
- (5 Marks)
- (b). Describe the essential items for inspection BEFORE, DURING and AFTER welding.
- (10 marks)

**Question 4**

- (a). Describe briefly what is Codes, Standards and Specification. (5 marks)
- (b). List **FIVE (5)** items on safety precautions when doing inspection work. (5 Marks)
- (c). Apart from code book, list **THREE (3)** other documents necessary for inspection, (5 Marks)
- (d). Describe how an internal discontinuity eg. porosity is detected and measured. (5 Marks)

**Section B**

**INSTRUCTION: Answer ALL Questions.**

**(40 Marks)**

**Please use the answer booklet provided.**

**Question 1**

The following questions refer to API 1104 Welding of Pipelines and Related Facilities Code Book, All answers must be supported with References in the Code Book (eg. Section 1, Ref 1.1)

- a. Which section of the code describe the "Design and Preparation of a Joint for Production Welding".
- b. Define "Single Qualification" and Multiple Qualification".
- c. List the welding processes mentioned for use with the code.
- d. The meaning of 'roll' welding.
- e. The base metals are grouped into **THREE (3)** groups based on their minimum yield strength. Name the **THREE (3)** groups.
- f. When performing a nick-break test, how wide the exposed area of fracture shall be (at least). What is the maximum dimension of any gas pockets(s).
- g. When conducting a procedure qualification on materials with an outside diameter of 135 mm and wall thickness of 10mm, how many number of tensile test(s) is / are required.
- h. What is the recommended practice in preparing a tensile specimen for testing.
- i. What are the conditions for a welder to be re-qualified.
- j. The number of root-bend test specimens required to qualify a welder on 8 in. OD pipe with a wall thickness less than or equal to 12.7 mm.

(20 Marks)

**Question 2**

Refer the Questions to Drawing ABC-123 provided.

- a. Identify the nozzle schedule of the following;
  - i. F3 DN 50
  - ii. MW1 DN 500
  - iii. N DN 100
- b. What are the test and operating pressure specified?
- c. Is any thermal insulation required?
- d. What is the total length of the vessel?
- e. What is the type of gusset plates and the quantity required?
- f. What test is required for all stainless steel materials?
- g. What is the welding detail for L.S 4a.b?
- h. What type of materials used for the shell?
- i. Describe the coating system.
- j. What are the reference drawings listed in the main drawing?

(20 Marks)

**END OF QUESTION**