



**UNIVERSITI KUALA LUMPUR**  
**MALAYSIA FRANCE INSTITUTE**

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**FINAL EXAMINATION**  
**JANUARY 2014 SESSION**

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**SUBJECT CODE** : FWD 22303  
**SUBJECT TITLE** : WELD DEFECT DT AND NDT  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 2.0 HOURS  
**DATE** :

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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, section A and B. Answer **ALL** questions in section A, for section B, answer **TWO (2)** questions only.
  6. Answer all questions in English.
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**THERE ARE 5 PRINTED PAGES OF QUESTIONS, EXCLUDING THIS PAGE**

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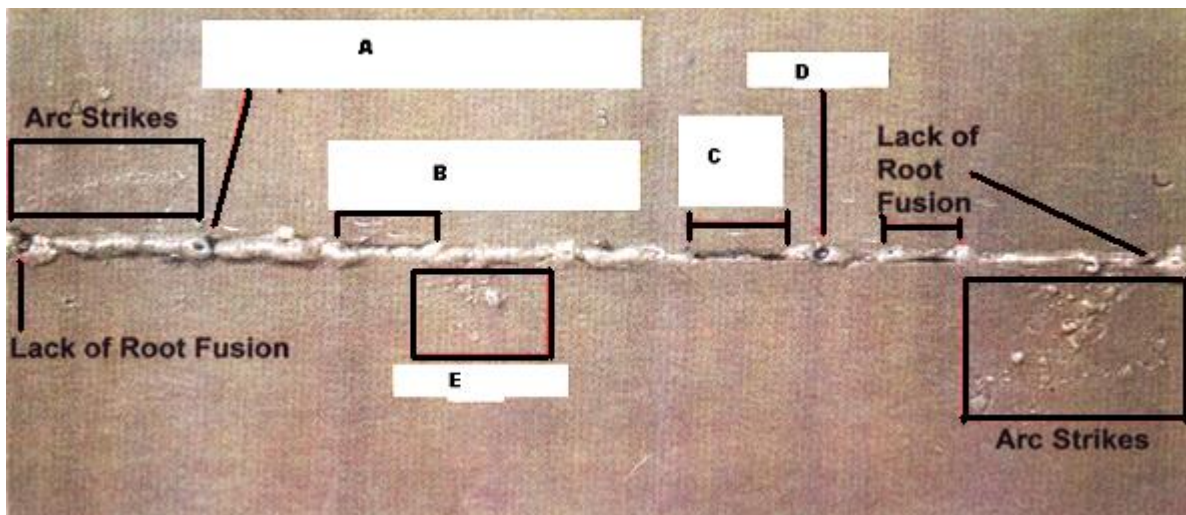
**SECTION A (Total: 60 marks)**

**INSTRUCTION: Answer ALL questions.**  
**Please use the answer booklet provided.**

**Question 1**

Answer the following questions;

- (a) Identify welding discontinuities for A, B, C, D and E in **Figure 1**. (There may be more than one discontinuity for each of them)



**Figure 1**

(5 marks)

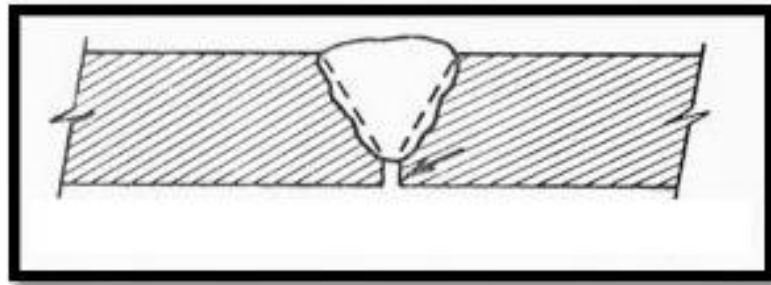
- (b) Differentiate the terms "defects" and "discontinuities" in welding. (3 marks)

- (c) Explain with sketches **THREE (3)** methods to minimize angular distortion in a single V groove welding (12 marks)

**Question 2**

- (a) Identify welding defect in **Figure 2**. List the possible causes and please recommend remedies.

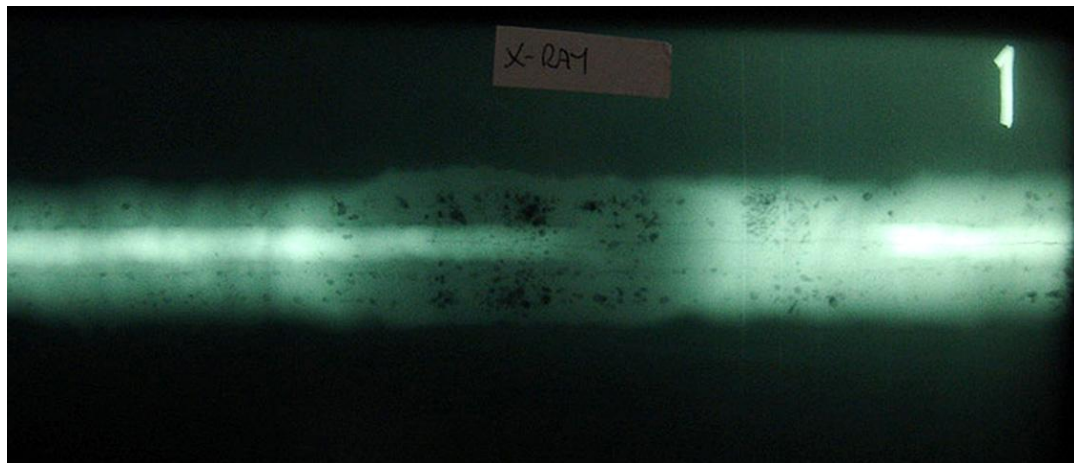
(8 marks)



**Figure 2**

- (b) A radiography image given in **Figure 3** shown internal porosities in welding. Write the possible causes of porosity in welding.

(8 marks)



**Figure 3**

- (c) List **four (4)** forms/ types of porosity.

(4 marks)

**Question 3**

- (a) Welding of some materials and for some service conditions may require preheating and/or post weld heat treatment (**PWHT**). Write **three (3)** reasons/purposes of preheating prior to welding.

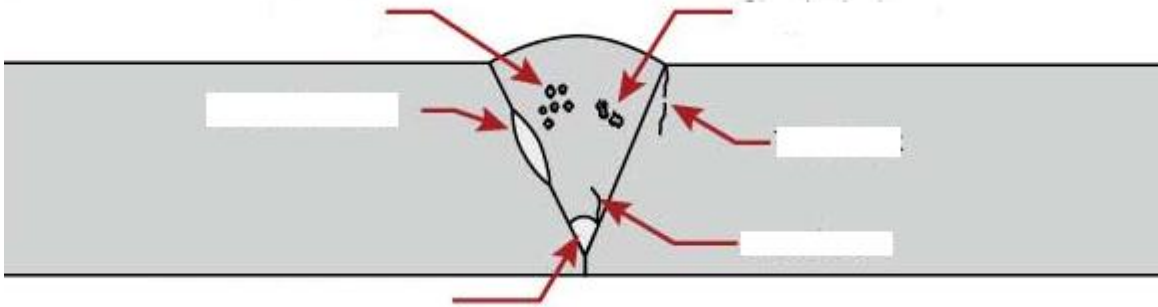
(9 marks)

- (b) State **four (4)** objectives of tensile test.

(8 marks)

- (c) Identify weld discontinuities in Figure 4

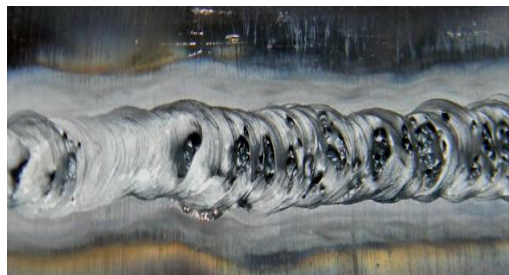
(3 marks)



**Figure 4**

**SECTION B (Total: 40 marks)****INSTRUCTION: Answer TWO (2) questions only.****Please use the answer booklet provided.****Question 1**

- (a) Briefly explain the following cracks in welding
1. Longitudinal cracks
  2. Transverse cracks
  3. Crater cracks
  4. Throat cracks
  5. Under bead/heat affected zone (HAZ) cracks
- (5 marks)
- (b) Write **four (4)** types and the purpose of Post weld heat treatment (PWHT) that you have learned
- (12 marks)
- (c) Define the term "Non destructive tests" (**NDT**).
- (3 marks)

**Question 2****Figure 5**

- (a) Solve the problem of voids in **SMAW** as shown in **Figure 5** by identifying the causes and providing solutions to overcome the defect.
- (10 marks)
- (b) In a lab test, you are required to carry out a non destructive test to trace any surface defects of welded ferrous materials. You are given two options, either to use magnetic particles inspection (**MPI**) or dye penetration inspection (**DPI**) to carry out the task. Choose any one of the given options, and write the procedure of inspection of your choice.
- (10 marks)

**Question 3**

(a) Write the criteria of **NDT** methods selection.

(10 Marks)

(b) Sketch the following welding irregularities

1. Root concavity
2. Underbead/HAZ crack
3. Longitudinal distortion in a T fillet weld
4. Overlap/cold lapping

(10 marks)

**END OF QUESTION**