



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2014 SEMESTER

SUBJECT CODE : FWD22303
SUBJECT TITLE : WELD DEFECTS, DT AND NDT
LEVEL : DIPLOMA
TIME / DURATION : 2.00 PM – 4.30 PM
(2.5 HOURS)
DATE : 5 JANUARY 2015

INSTRUCTIONS 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 **TWO (2)** sections. Section A and B. Answer all questions in Section A and **TWO (2)** questions in Section B.
 6. Answer all questions in English.
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THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

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

Question 1

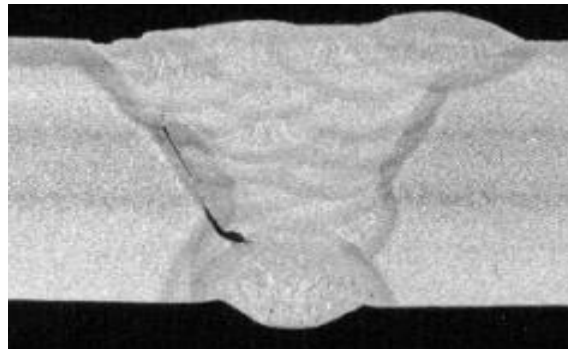
Define the following terms

- (a) Defects (5 marks)
- (b) Discontinuities. (5 marks)
- (c) Non destructive test (NDT) (5 marks)
- (d) What cause distortion in welding? (5 marks)

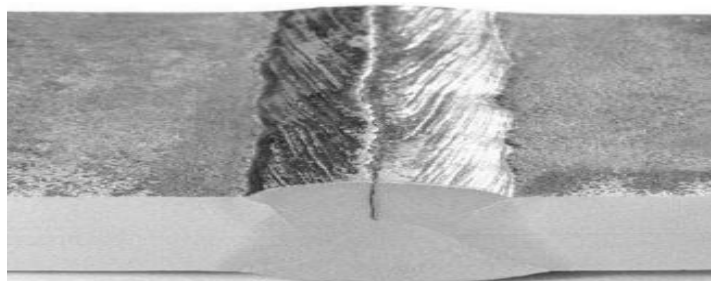
Question 2

- (a) Identify defects of the following graphics and explain the cause of defects (20 marks)

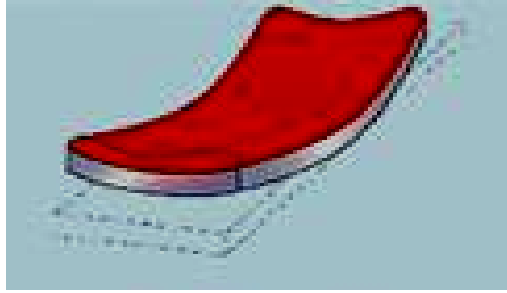
(i)



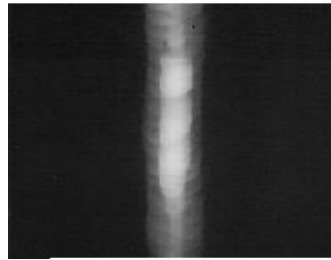
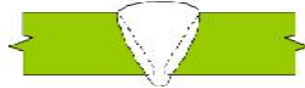
(ii)



(iii)



(iv)



Question 3

- (a) Explain the principles of Dye Penetration Inspection (DPI) (5 marks)
- (b) What types of materials that Dye Penetrant Inspection (DPI) can be applied on? (5 marks)
- (c) Write five (5) common discontinuities found in weldment. (5 marks)
- (d) Explain the two types of developers use in Dye Penetrant Inspection (DPI). (5 marks)

SECTION B (Total: 40 marks)**INSTRUCTION: Answer TWO (2) questions only.****Please use the answer booklet provided.****Question 4**

- (a) Suggest a remedy to overcome angular distortion in a tee fillet welding. (Please provide a proper sketch)
(5 marks)
- (b) Visual inspection is the most extensively used nondestructive examination on weldments. It is simple and relatively inexpensive. Identify the three (3) stages of visual inspection in welding and write down what should be checked in each stage.
(9 marks)
- (c) Briefly explain the benefits of post weld heat treatment (PWHT) in welding.
(6 marks)

Question 5

- (a) In a lab activity, you are requested to perform an NDT on a welded aluminum parts to find surface defects. You are provided with a DPI and MPI equipment. Which NDT method would you use, and explain the reason/s
(5 marks)
- (b) Explain the differences between Hot crack and Cold crack.
(5 marks)
- (c) Some materials require pre heating prior to welding. Write reasons for the requirements
(10 marks)

Question 6

- (a) Figure A below is a radiographic image which shows a discontinuity in welding. Identify the defect and list down two (2) possible causes of that defect in Shielded Metal Arc Welding (SMAW) process.

(8 marks)

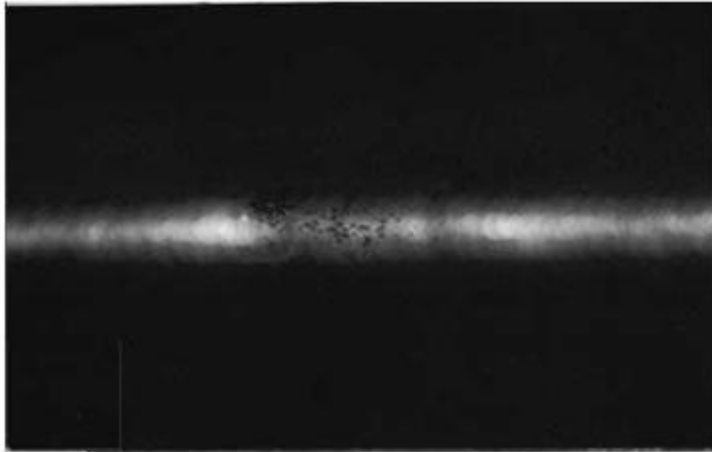


Figure A

- (b) A bend test conducted on a welded 304 stainless steel test specimen shown that there were lack of sidewall fusion and no fusions between weld pass/layer. What are the causes of those defects? What is your suggestion to eliminate those defects? Please list two (2) causes and two (2) remedies

(8 marks)

- (c) Sketch the following defects

(4 marks)

- (i) Toe crack in a fillet weld
- (ii) Root concavity/ suckback/ underwashing

END OF QUESTION