COURSE CODE : JQD 31303
COURSE TITLE : FUNDAMENTALS OF INSPECTION TECHNOLOGY
PROGRAMME LEVEL : DIPLOMA
DATE : 23 MAY 2016
TIME : 2.30 PM – 5.30 PM
DURATION : 3 HOURS

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. This question paper consists of TWO (2) sections.
4. Answer ALL questions in Section A. Choose TWO (2) questions in section B.
5. Please write your answers on the answer booklet provided.
6. Please answer all questions in English only.

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

(a) List the THREE (3) types of surface defect. (3 marks)

(b) Differentiate the terms of Corner Joint and Fillet Weld. (6 marks)

(c) List the FIVE (5) defects can be inspect using visual inspection method (5 marks)

(d) Construct the weld region including heat affected zone (HAZ), base metal and fusion zone with the types of defects below
   i. Root crack and lack of fusion on U groove butt joint. (3 marks)
   ii. Concave cap and toe crack on single V groove butt joint (3 marks)

Question 2

(a) Explain the procedures of post cleaning in dye penetration process (4 marks)

(b) Identify SIX (6) types of corner joint. (6 marks)

(c) List the instrument used in dye penetration process. (4 marks)

(d) Identify THREE (3) non-destructive testing method can be used for inspect toe crack. (6 marks)
Question 3

(a) Explain the THREE (3) possible causes for overlap defect. (3 marks)

(b) Give SEVEN (7) defects cause current too high. (7 marks)

(c) Welds can be done in all four positions such as horizontal, flat, vertical and overhead. Explain the characteristics of horizontal position and overhead position. (5 marks)

(d) Construct the following welding defects on the dissimilar weldment of AA6351 and AA6061
   i. Root crack (1 mark)
   ii. Root undercut (1 mark)
   iii. Underfill (1 mark)
   iv. Face undercut (1 mark)
   v. Surface breaking Porosity (1 mark)
SECTION B (Total: 40 marks)

INSTRUCTION: Choose TWO (2) questions only.
Please use the answer booklet provided

Question 1

(a) Draw linear porosity and cluster porosity defect on the square butt joint.  

(b) Explain the procedure for inspect defect using magnetic particle inspection method.  

(c) Describe right steps of dye penetration testing for examining defect on AA5083 welded joint.  

(d) The material used in this experiment was 6061 aluminum alloy with a thickness of 10 mm. The material was cut into several pieces with widths of 100 mm according to the standard length of ASTM E8M 04. Grooving was done using a milling machine with an angle of 40 degree for each cutting part, according to the specification of a single V–groove joint. Construct the workpiece of 6061 aluminum alloy after complete grooving process.  

(5 marks)

(4 marks)

(5 marks)

(6 marks)
Question 2

(a) List THREE (3) apparatus used in eddy current testing method. (3 marks)

(b) List TWO (2) types of welding position (4 marks)

(c) Decide which type of non-destructive testing that can be used to obtain the information required below:
   i. Inspect burn-through defect on AA6083 joint (2 marks)
   ii. Inspect arc strike defect on AA 6061 joint (2 marks)
   iii. Measure dimension of workpiece AA6082 (2 marks)
   iv. Inspect surface irregularity on welded joint of AA6351 (2 marks)

(d) Select the best non-destructive testing method for inspect overlap defect and give your reason. (5 marks)

Question 3

(a) List SIX (6) types of butt joint. (6 marks)

(b) List FOUR (4) destructive test can be used to evaluate the weldment. (4 marks)

(c) Explain the procedure for measure micro-hardness of weldment using Vicker hardness tester. (4 marks)

(d) Construct the principle of gas metal arc welding process. (6 marks)

END OF EXAMINATION PAPER