



**UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF INDUSTRIAL TECHNOLOGY**

**FINAL EXAMINATION
JANUARY 2016 SEMESTER**

COURSE CODE : JQB 30203
COURSE TITLE : INSPECTION TECHNOLOGY
PROGRAMME LEVEL : BACHELOR
DATE : 31 MAY 2016
TIME : 9.00 AM – 12.00 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 ONE (1) section.**
 - 4. Choose FOUR (4) questions only.**
 - 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.

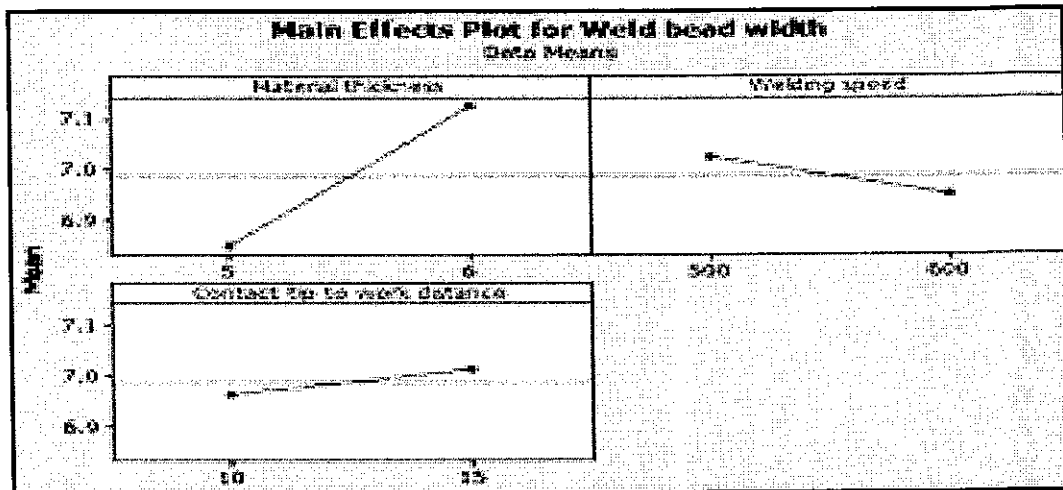
(Total: 100 marks)

INSTRUCTION: Answer only FOUR (4) questions.

Please use the answer booklet provided

Question 1

Gas metal arc welding (GMAW) is one of the most widely used arc welding process. It has been used to joint material AA6061. The dimension of workpiece is 100 mm long x 60 mm wide x 9 mm thick was prepared and then welded.



Graph 1: Effect of welding speed, material thickness and contact tip to work distance on weld bead width

- (a) Interpret the results based on Graph 1 and show the lower level of welding speed and material thickness. (7 marks)
- (b) Construct overlap and incomplete fusion on bevel groove butt joint of AA6061. (6 marks)
- (c) Sketch the instrument that can be used for inspect single slag inclusion. (4 marks)
- (d) Sketch the underfill defect and recommend the welding practical way for overcome underfill defect. (8 marks)

Question 2

- (a) List **SIX (6)** defects can be inspecting by radiography testing method. (6 marks)
- (b) List **SIX (6)** sub-surface defects that can be examining using ultrasonic testing method. (6 marks)
- (c) Describe the characteristics of groove weld and fillet weld. (5 marks)
- (d) Construct the following welding defects on dissimilar weldment of AA6061 and AA6351.
- i. Toe crack and linear porosity on bevel groove joint. (4 marks)
 - ii. Over penetration and lack of penetration on J groove butt joint. (4 marks)

Question 3

- (a) Explain the procedure of dye penetration inspection for inspect root crack defect on square butt joint of AA6061. (10 marks)
- (b) Outline **SEVEN (7)** defects that can be inspect using visual inspection method. (7 marks)
- (c) List **THREE (3)** weld defects can be examine by eddy current inspection method. (3 marks)
- (d) Construct the working principle of surface cleaning in magnetic particle inspection process. (5 marks)

Question 4

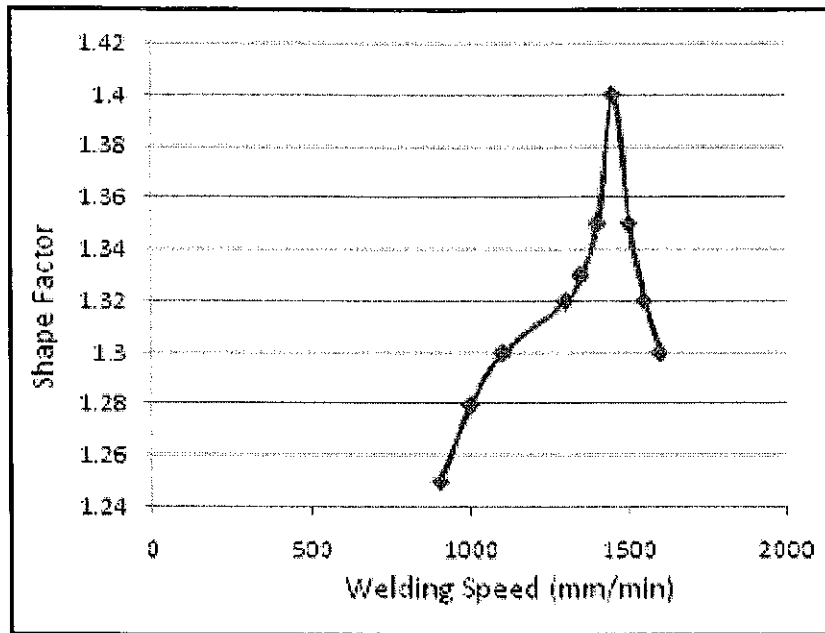


Figure 1: Effect of welding speed on shape factor

- (a) Analyze the result based on Figure 1. (9 marks)
- (b) Compare the differences between engineering change notice (ECN) and non-conformance report (NCR). (9 marks)
- (c) Compare Tee Joint and Corner Joint. (3 marks)
- (d) Construct the following welding defect on the double U groove butt joint of AA5083.
 - i. Face undercut (1 marks)
 - ii. Cluster porosity (1 marks)
 - iii. Slag inclusion (1 marks)
 - iv. Excess penetration (1 marks)

Question 5

- (a) Construct the fillet and angular distortion. (5 marks)
- (b) Set up the equipment and material that used in eddy current testing and visual inspection. (6 marks)
- (c) Decide which type of non-destructive testing that can be used to obtain the information required below:
- i. Inspect irregular root penetration defect on AA6061 joint (2 marks)
 - ii. Inspect uneven leg length defect on AA 6061 joint (2 marks)
 - iii. Measure thickness of workpiece AA6061 (2 marks)
 - iv. Inspect over penetration on welded joint of AA6061 (2 marks)
- (d) Construct center line crack and base metal crack on single V joint of AA5082 and AA6351. (6 marks)

END OF EXAMINATION PAPER

