



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2015/2016**

**COURSE NAME : WELDING TECHNOLOGY**  
**COURSE CODE : BNM 30703**  
**PROGRAMME : 3 BNM**  
**EXAMINATION DATE : DECEMBER 2015**  
**DURATION : 2 HOURS**  
**INSTRUCTION : ANSWER ALL QUESTION**

**THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES**

- Q1**
- (a) Give **TWO (2)** reasons on the important of welding. (2 marks)
  - (b) Explain **TWO (2)** main welding variables in GMAW and the effect on weld quality (4 marks)
  - (c) Propose an electrode code (in accordance with AWS A5.5 classification system) that suitable for general welding work. Support your suggestion by explaining the meaning of each number on the code. (5 marks)
  - (d) Analyse the effect of current polarity such as Direct Current Electrode Negative (DCEN) and Direct Current Electrode Positive (DCEP) on the weld bead. Support your assessment with schematic diagram of the electrical circuit, neat sketch of the weld bead cross section and the usage. (9 marks)
- Q2**
- (a) Define the term of solid state welding in accordance with AWS 3.0 and give **THREE (3)** processes classified in this group. (4 marks)
  - (b) List **THREE (3)** advantages and disadvantages of Electron Beam Welding (EBW) (6 marks)
  - (c) Explain with neat sketch a cycle (consist of 4 stages) of resistance spot welding. (10 marks)
- Q3**
- (a) Explain the “carbon equivalent” of commercial steel and write down the formula. (3 marks)
  - (b) Explain why hydrogen is concern in welding. Provide example that illustrate the impact of the presence of hydrogen in weldment. (4 marks)
  - (c) Oil, moisture or other contaminants present on the filler wire and material surface could be a cause for imperfection when welding aluminium and aluminium alloys. Outline the defects related with this situation and the cleaning techniques available which help to minimised the imperfection. (6 marks)
  - (d) Preheating before welding in some carbon steel is very important in order to eliminate hydrogen cracking. Outline the main factors in determining the pre-heating temperature and the methods of applying the preheating process. (7 marks)

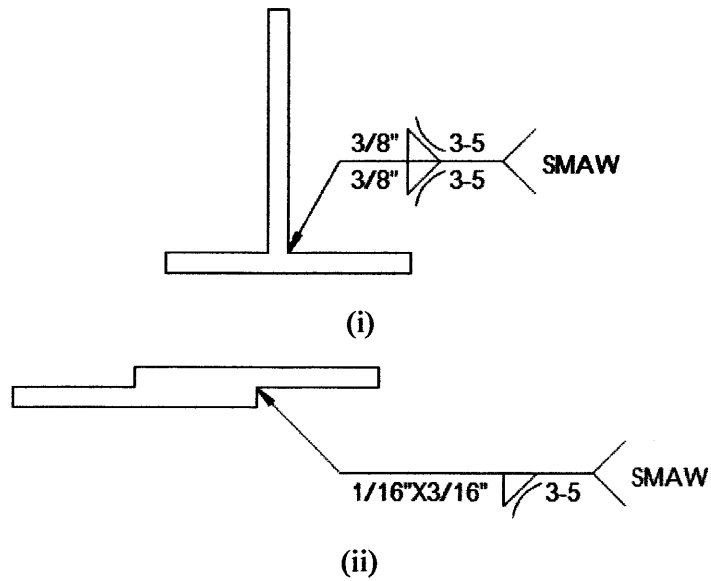
- Q4** (a) Interpret the welding symbols shown in **Figure Q4 (a) (i) and (ii)**. In answering this question, provide the sketch of the joint for right side view and plan.  
(10 marks)
- (b) Produce the welding symbol for the joint sketch shown in **Figure Q4 (b) (i) and (ii)**  
(10 marks)
- Q5** (a) Define the term of Welding Procedure Specification (WPS) and Welding Procedure Qualification Record (PQR) in accordance with AWS 3.0.  
(2 marks)
- (b) List out **THREE (3)** advantages and disadvantages of Dye Penetrant Test and Magnetic Particle Test.  
(6 marks)
- (c) Discuss with neat sketch **THREE (3)** types of arc welding defects, causes and remedies.  
(12 marks)

**- END OF QUESTION -**

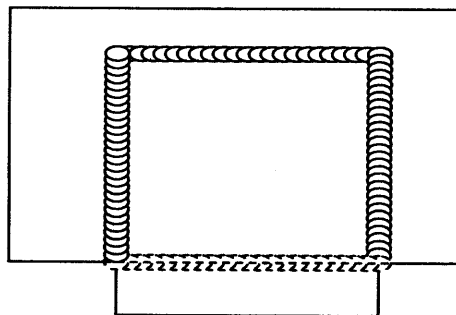
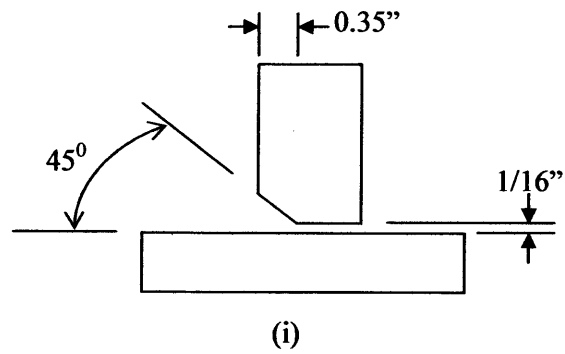
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**FIGURES Q4 (a)**



(ii)

**FIGURES Q4 (b)**