



SET B

**UNIVERSITI KUALA LUMPUR**  
MALAYSIA FRANCE INSTITUTE

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**FINAL EXAMINATION**  
**JANUARY 2011 SESSION**

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**SUBJECT CODE** : FFD 22402 / FWD 22402  
**SUBJECT TITLE** : WELDING PROCEDURE AND SPECIFICATION  
**LEVEL** : DIPLOMA  
**DURATION** : 3.30pm – 5.30pm  
( 2 HOURS )  
**DATE** : 05 MAY 2011

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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 4 PRINTED PAGES OF QUESTIONS AND 2 PAGES OF APPENDIX , EXCLUDING THIS PAGE

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**SECTION A (Total: 60 marks)****INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1**

Define the acronyms below.

- a. WPS (2 marks)
- b. WPQR (2 marks)
- c. WQT (2 marks)

**Question 2**

What is the purpose of WPQR and why do we need a new Welding procedure if any changes of essential variables are made in WPQR. (10 marks)

**Question 3**

List down 4 major items classified as "Essential Variables" in welding procedure. (8 marks)

**Question 4**

What is the maximum qualification thickness range for base metal having a thickness (T) and deposited weld metal thickness (t), if the specimen thickness is 25mm. (10 marks)

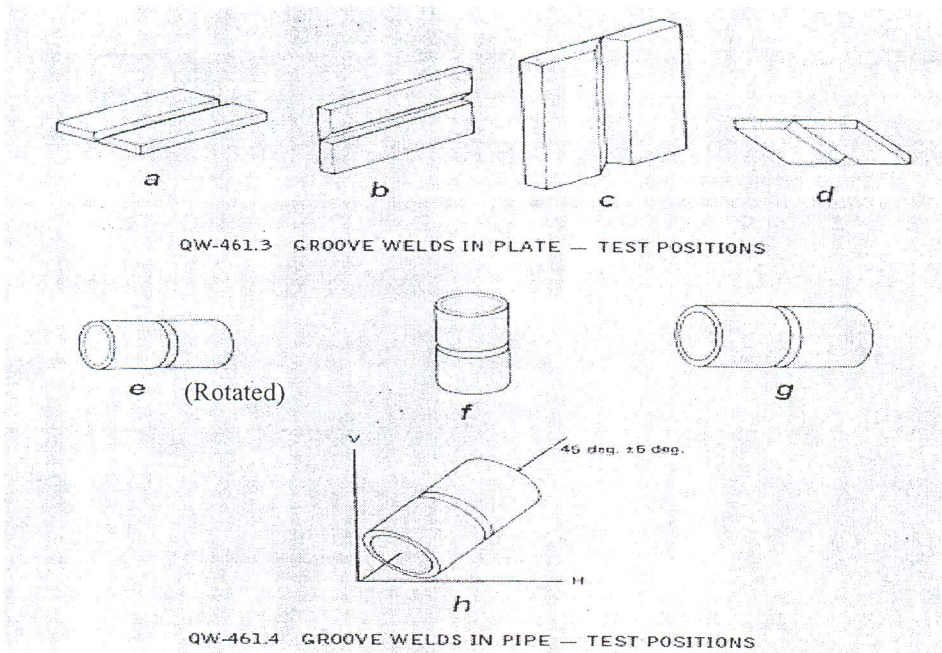
**Question 5**

The code (ASME IX) is divided into 5 parts as follows:  
Identify the clause (QW) of each part.

- a. QW 100 (2 marks)
- b. QW 200 (2 marks)
- c. QW 300 (2 marks)
- d. QW 400 (2 marks)
- e. QW 500 (2 marks)

**Question 6**

According ASME, QW 461(plate and pipe) for **Position**. From the graphic given name weld position.

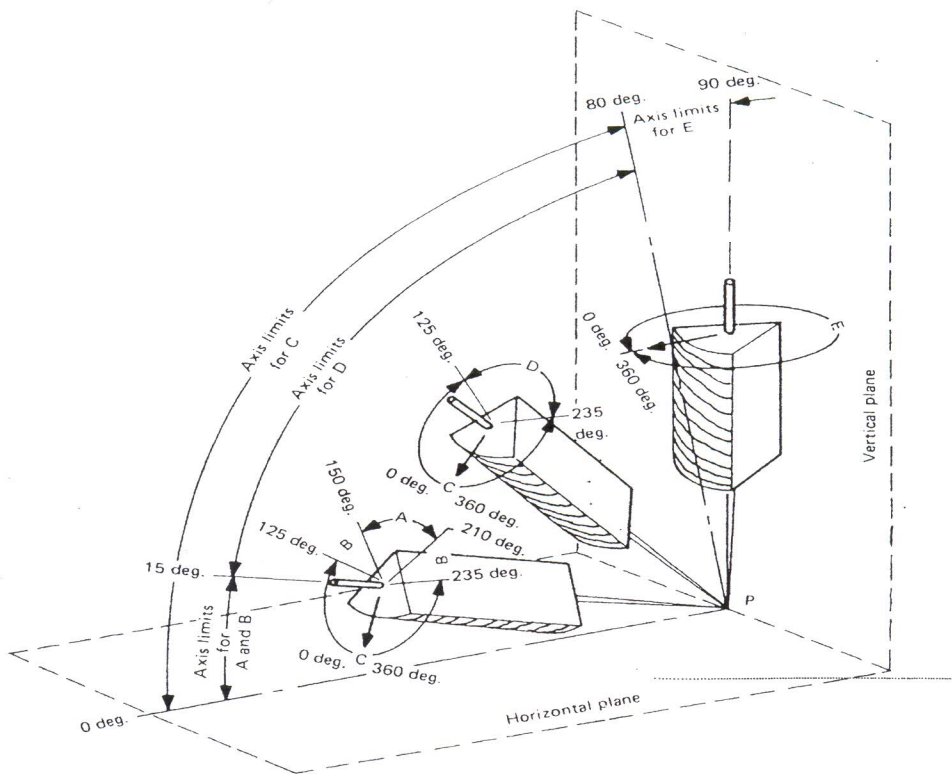


(16 marks)

Question 7

Refer to diagram below, please fill in the respective position at the position area (i, ii, iii, iv, v)

Tabulation of Positions of Fillet Welds			
Position	Diagram Reference	Inclination of Axis, deg.	Rotation of Face, deg.
i	A	0 to 15	150 to 210
ii	B	0 to 15	125 to 150 210 to 235
iii	C	0 to 80	0 to 125 235 to 360
iv	D	15 to 80	125 to 235
v	E	80 to 90	0 to 360



(15 marks)

Table 1

- Position i .....
- Posirion ii .....
- Position iii.....
- Position iv.....
- Position v.....

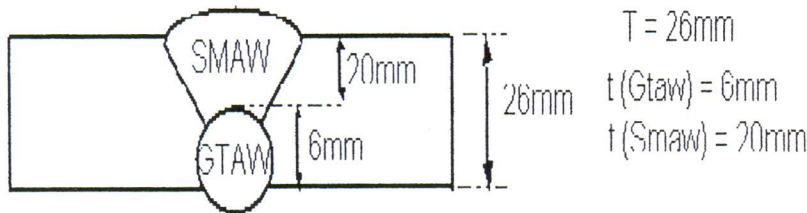
**SECTION B (Total: 40 marks)**

**INSTRUCTION: Answer TWO (2) question only, Q 1 and Q2 or Q3**

Please use the answer booklet provided.

1

Approximate deposit thickness of each process should be recorded QW200.2b



**Material specification: P1 Gr1 to P1 Gr1 and Spec. No SA36**

By referring the welded figure, you are required to perform WPS according to ASME IX. Heat input shall calculate every each layer. Just assume all the data. Please use the standard form provided at appendix 1 (20 marks)

2 By referring the figure above,

- i. What is the base metal thickness approved range for the above welded joint (5 marks)
- ii. If the base metal used for procedure qualification is P No. 1 to P No. 2, what is the range of base metal qualified? (5 marks)
- iii. What is the range qualified for each welding process (10 marks)

3

By referring the figure above:

- i. Assume the WPS was done by one welder, what is the range qualified for the base metal thickness and the thickness range welded by each welding process (6 marks)
- ii. If SMAW process deposit weld less than 19 mm, assume 18 mm and GTAW deposit weld 8mm. Will the SMAW process qualified to weld 52mm thickness (6 marks)
- iii. Give your idea how to qualify SMAW process to weld 52mm base metal thickness, if SMAW process deposit weld is 18mm. (8 marks)

**END OF THE QUESTION**

APPENDIX 1

**QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATIONS (WPS)**  
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name \_\_\_\_\_ By: \_\_\_\_\_  
 Welding Procedure Specification No. \_\_\_\_\_ Date \_\_\_\_\_ Supporting PQR No.(s) \_\_\_\_\_  
 Revision No. \_\_\_\_\_ Date \_\_\_\_\_

Welding Process(es) \_\_\_\_\_ Type(s) \_\_\_\_\_  
(Automatic, Manual, Machine, or Semi-Auto.)

JOINTS (QW-402)	Details
Joint Design _____	
Backing (Yes) _____ (No) _____	
Backing Material (Type) _____ <small>(Refer to both backing and retainers.)</small>	
<input type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other	
Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.	
(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g., for notch toughness procedures, for multiple process procedures, etc.)	

**\*BASE METALS (QW-403)**

P-No. \_\_\_\_\_ Group No. \_\_\_\_\_ to P-No. \_\_\_\_\_ Group No. \_\_\_\_\_

OR

Specification type and grade \_\_\_\_\_  
 to Specification type and grade \_\_\_\_\_

OR

Chem. Analysis and Mech. Prop. \_\_\_\_\_  
 to Chem. Analysis and Mech. Prop. \_\_\_\_\_

Thickness Range:

Base Metal: \_\_\_\_\_ Groove \_\_\_\_\_ Fillet \_\_\_\_\_

Other \_\_\_\_\_

*FILLER METALS (QW-404)		
Spec. No. (SFA) _____		
AWS No. (Class) _____		
F-No. _____		
A-No. _____		
Size of Filler Metals _____		
Weld Metal		
Thickness Range:		
Groove _____		
Fillet _____		
Electrode-Flux (Class) _____		
Flux Trade Name _____		
Consumable Insert _____		
Other _____		

\*Each base metal-filler metal combination should be recorded individually.

