



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2011 SESSION

SUBJECT CODE : FFD 22302
SUBJECT TITLE : BASIC PRESSURE VESSEL DESIGN AND STEEL STRUCTURES
LEVEL : DIPLOMA
TIME/DURATION : 3.30 pm – 5.30 pm
(2.0 HOURS)
DATE : 04 MAY 2011

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. For Section B, answer TWO (2) question only.
 6. Answer all questions in English.
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THERE ARE 5 PRINTED PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.**

1. Which ASME code refers to the rules on the construction of pressure vessels?
(2 marks)

2. What do ASME I and ASME II encompass on?
(2 marks)

3. Aerated water bottles can also be considered as pressure vessel. Explain how?
(2 marks)

4. Which item/part of pressure vessel that will be used as lifting attachments?
Name TWO (2) of the items.
(2 marks)

5. Name FOUR (4) types of dish heads?
(2 marks)

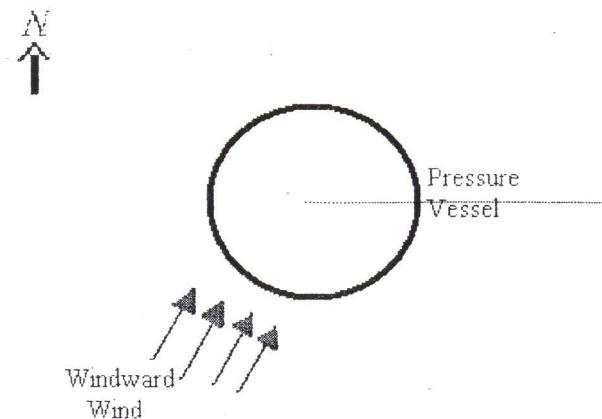
6. State the common function of all the flanges.
(2 marks)

7. What are the TWO (2) methods for measuring corrosion?
(2 marks)

8. What is the economical design of the major and minor vessel?
(3 marks)

9. A manhole is provided in the design to allow for an examination and cleaning.
Where is the preferable location of the manhole in the design?

- (3 marks)
10. What are preferred shapes of pressure vessel openings?
(3 marks)
11. What is the surface preparation and care taken before pressure vessels are painted?
(3 marks)
12. The transportation of vessels by truck requires some considerations. Name TWO (2) of the considerations.
(3 marks)
13. Which locations are recommended to place the name plate of the pressure vessel?
(3 marks)
14. Water at room temperature is filled into the pressure vessel for the hydrostatic test. What is the minimum duration for the test?
(4 marks)
15. The windward wind from southwest hit and passes the pressure vessel. What type of stresses the pressure vessel is experiencing before and after the windy situation. Name the wind type after hitting the pressure vessel.



(4 marks)

SECTION B (Total: 60 marks)

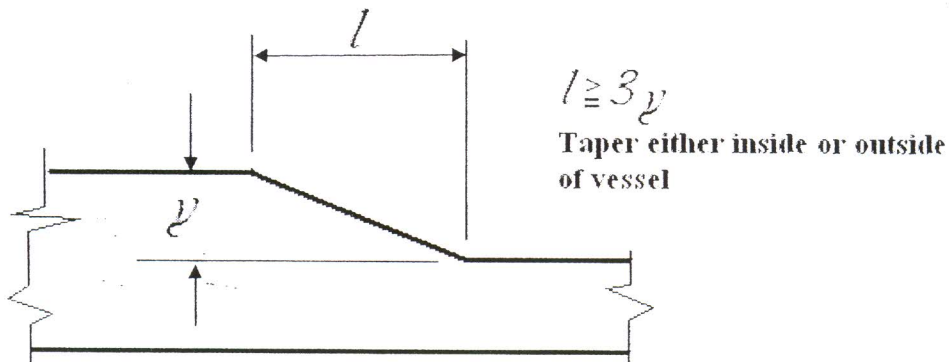
INSTRUCTION: Answer TWO (2) questions only.

Please use the answer booklet provided.

Question 1

- a) List down the FOUR (4) pressure vessel design considerations. (8 marks)

- b) From the diagram below calculate l , if $y = 3.2\text{mm}$. If the thinner plate is 6.7mm, what is the thickness of the thicker plate? **To answer convert your measurement to inches. Take 1 inch = 25.4mm**



(10 marks)

- c) In terms of horizontal vessels, in which conditions stiffener ring will be use?
Where should the stiffener rings be located?

(12 marks)

Question 2

- a) Horizontal vessels supported by saddles are subjected to different types of stresses. Name the THREE (3) types of stresses.

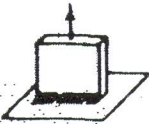

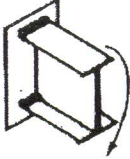
(6 marks)

- b) The expansion and contraction of horizontal vessels supported by saddles must be allowed to move based on the information

- d.1) State the type of bolts needed to use.
- d.2) When should the slide bearing be used?
- d.3) How should concrete saddles be considered?

(9 marks)

- c) The height of tall towers depends greatly on its functions. To erect a tower, loadings such as wind and earthquakes are also considered when necessary. Explain why with different height stages, different plate thicknesses are utilized.

FORMULAS FOR FORCES ON WELD		
 $W = \frac{P}{A_w}$ <p>TENSION OR COMPRESSION</p>	 $W_s = \frac{V}{A_w}$ <p>VERTICAL SHEAR</p>	 $W_b = \frac{M}{S_w}$ <p>BENDING</p>

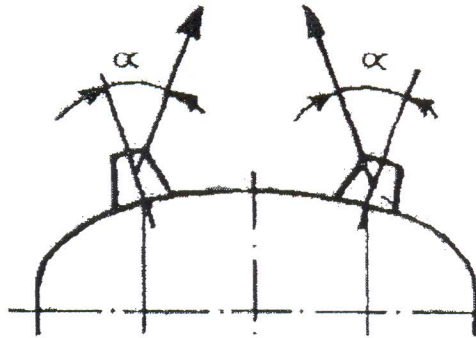
(15 marks)

Question 3

- a) The height of tall towers depends greatly on its functions. To erect a tower, loadings such as wind and earthquakes are also considered when necessary. Explain why with different height stages, different plate thicknesses are utilized.

(12 marks)

- b) Determine the required size of the fillet weld, w [inches] if the allowable load on weld, $f = 9.6$ kips per in^2 leg area. ***W is the result from 2 (c).***



$$w = \frac{W}{f}$$

(12 marks)

- c) The installations of pressure relief devices or safety valves are a must in terms of design considerations. State its main purpose.

(6 marks)

END OF QUESTION