Document No : UniKL MFI_SD_AC41
Revision No: 02
Effective Date: 01 December 2008

CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR

MALAYSIA FRANCE INSTITUTE

FINAL EXAMINATION

JANUARY 2014 SESSION

SUBJECT CODE	:	**FFB 32203**
SUBJECT TITLE	:	**DESIGN AND FABRICATION (VESSELS)**
LEVEL	:	**BACHELOR**
TIME/DURATION	:	**(2 HOURS)**
DATE / TIME	:	

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.**
7. **No graph paper is appended.**

THERE ARE 5 PRINTED PAGES OF QUESTIONS, AND NO PAGE OF GRAPH PAPER EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

1. If calculations are not made, design pressure can be used as its maximum allowable working pressure. What is the guideline setting between operating pressure and design pressure?

(5 marks)

2. Lethal substances, either liquid or gaseous are poisonous. Why is copper piping not recommended to transfer/move acetylene content?

(5 marks)

3. Which ASME Code is used directly to construct/fabricate pressure vessel? What should a manufacturing company adhere to in terms of the constructing pressure vessel code?

(5 marks)

4. Normally hydrostatic test will be conducted to a pressure vessel. When should it be conducted and what is the content for the test and its minimum test duration?

(5 marks)

5. The computation of wind load is based on Standard ASCE-02. What is the regulated ratio for tall/vertical vessel? Calculate the ratio, when a vessel is 65 ft. high. Justify if this is allowable.

(5 marks)

6. Write the main difference in terms of design for major vessels and minor vessels. State the purposes of a manhole.

(5 marks)

7. State the main function between a pressure relief valve and a vacuum breaker.

Figure 1 Pressure Relief Valve and Vacuum Breaker

(5 marks)

8. How would a thin-wall pressure vessel be categorized? It has to retain its shape to the intended/design pressure. In doing this, the pressure vessel will experience **TWO (2)** types of stresses. Draw the segmented stresses diagram.

(5 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)** design considerations.

(6 marks)

b. Pressure relief devices or safety valve is a must in terms of design consideration. State its main purpose of installation.

(7 marks)

c. The total erection weight of a vessel of items 1 through 18 is 25,407 kg. For items 1 through 11 the weight is 19,350 kg.

i. Calculate the weight of items 12 through 18?

(7 marks)

ii. If the overweight of plate for items 1 through 11 is 543 kg, what is the weight in kg and percentage of the weight added by welding? Take 6% of weight of items 1 through 11 for overweight of welding.

(10 marks)

Question 2

a. The optimum vessel size is building a vessel with the minimum material and the correct ratio of length to diameter. The optimum ratio of length to the diameter can be found by the following procedure.

$$F = \frac{P}{C\ S\ E}$$

$$\text{The length of the vessel} = \frac{4V}{\pi D^2}$$

b. With the given design data find the optimum diameter and length. P = 120psi, V = 1000 cu.ft. S = 18 000psi, E = 0.90, C = 0.0520 in. Utilize the chart, to determine the optimum vessel size given.

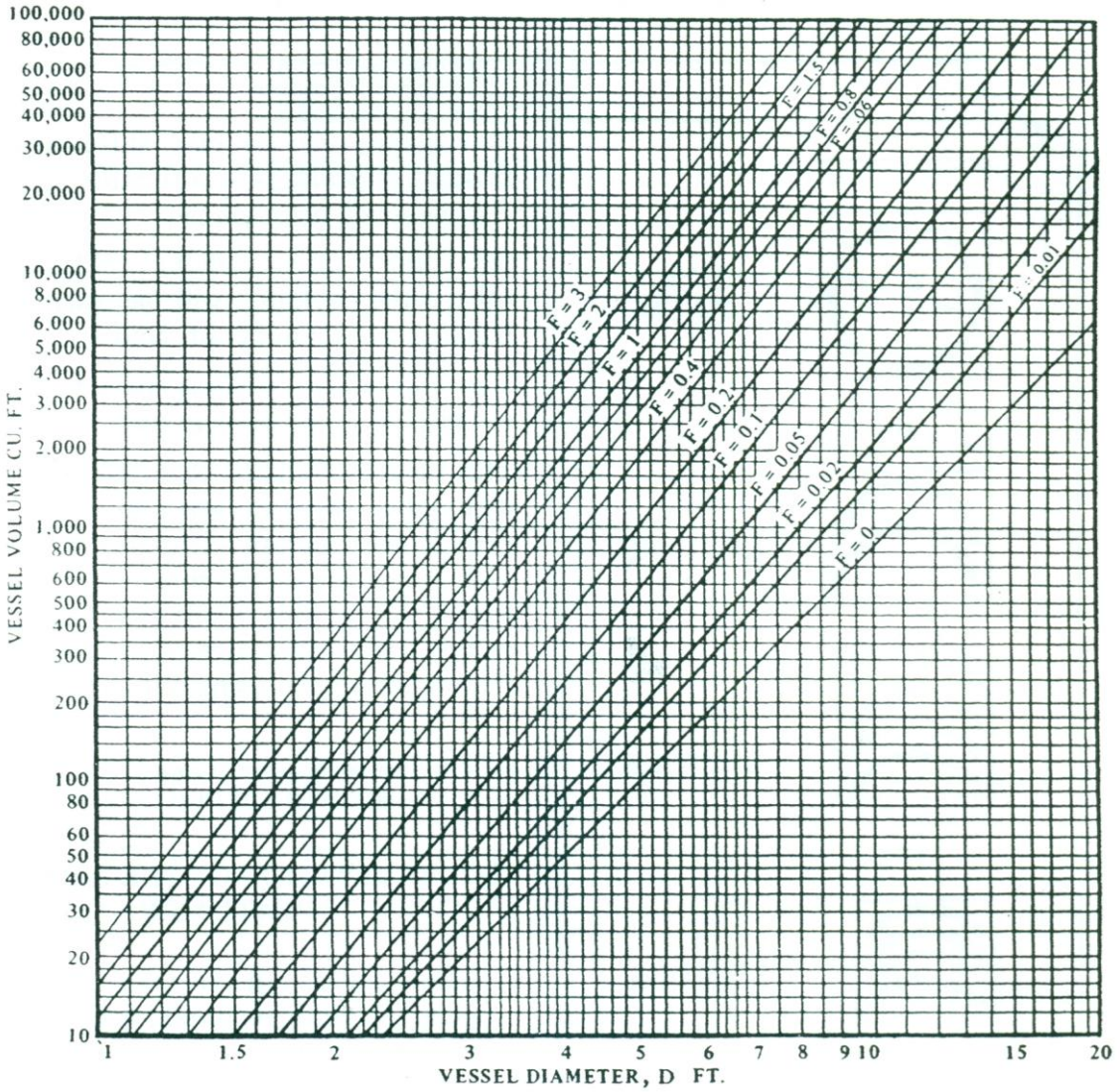

Chart 1 To Determine the Optimum Vessel Size

(30 marks)

Question 3

A thin-wall horizontal vessel will be supported with two saddles;

a) Compare and describe the Condition 1 and Condition 2 of the vessel.

b) Justify the location of the saddles of the thin-wall vessel.

c) What is the name of the saddle A and saddle B?

d) State the significant difference between the saddle A and saddle B in term to the Condition 1 and Condition 2.

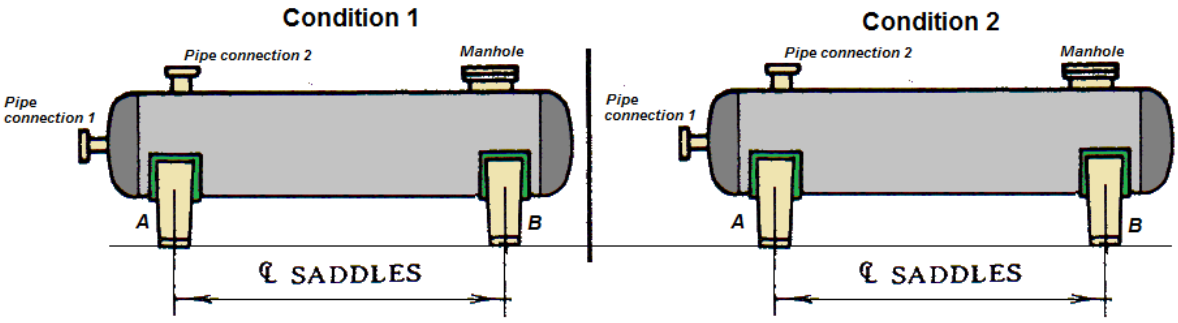

Figure 2 A Horizontal Pressure Vessel with Two Different Conditions

(30 marks)

END OF QUESTION