



SET A

UNIVERSITI KUALA LUMPUR

Malaysia France Institute

FINAL EXAMINATION

SEPTEMBER 2013 SESSION

SUBJECT CODE : FFB 32303
SUBJECT TITLE : DESIGN & FABRICATION (STEEL STRUCTURE)
LEVEL : BACHELOR
TIME / DURATION :
(2.5 HOURS)
DATE :

INSTRUCTION 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 **SIX (6)** questions. Answer **FOUR (4)** questions only.
6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer FOUR (4) questions only.

Please use answer booklet provided.

Question 1

- a). Define what is DESIGN and FABRICATION. (5 Marks)
- b). Name the main processes and activities carried out during fabrication. (5 Marks)
- c). State the OBJECTIVES of Welding Design and the **FIVE (5)** points for Designing of welded structures. (15 Marks)

Question 2

- a). Define what is STRESS, STRAIN and STRESS CONCENTRATION and gives examples. (5 Marks)
- b). Sketch a Stress-Strain Diagram of a typical ductile material and the main elements in the graph. (5 Marks)
- c). State and describe the **SIX (6)** basic modes of deformation caused by external loads. (15 Marks)

Question 3

- a). State the effect of the following chemical elements in steel;
(i). Carbon (ii). Sulphur and (iii). Chromium (5 Marks)
- b). Name and Describe any **THREE (3)** Mechanical properties of metals. (10 Marks)
- c). Define what is FATIGUE Strength and describe how fatigue strength test was conducted. (10 Marks)

Question 4

- a). Name and sketch **FIVE (5)** types of weld joint. (5 Marks)
- b). Describe the **SIX (6)** principles of welded joints and gives examples. (10 Marks)
- c). Choose the correct **ONE (1)** among words and mark it on its alphabetical letter;
- (I). The elongation and the reduction of area of steel materials are also known as;
(i) elasticity. (ii) plasticity. (iii) ductility. (iv) magnetism.
- (II). The nature of metals, that the strain caused by a load disappears to become zero when the load is removed, is defined as;
(i). Elasticity (ii). Plasticity (iii). Ductility (iv). Magnetism
- (III). High tensile strength steel is the steel material that has high;
(i). strength (ii). toughness (iii). elongation (iv). plasticity
- (IV). The yield ratio of high tensile strength steels is generally;
(i). larger than that of low carbon steel.
(ii). smaller than that of low carbon steel.
(iii). nearly the same as that of low carbon steel.
(iv). unable to compare with that of low carbon steel.
- (V). In arc welding, the heat-affected zone (HAZ) is subject to;
(i). a change in the microstructure but no change in the mechanical properties.
(ii). no change in the microstructure but a change in the mechanical properties.
(iii). changes in both the microstructure and mechanical properties.
(iv). no change in either the microstructure or mechanical properties. (10 Marks)

Question 5

- a). Explain what is Total Quality Control (TQC) and Quality Control Circle (QCC).
(5 Marks)
- b). Name and sketch any **THREE (3)** types of QC Tools.
(10 Marks)
- c). **ISO 3834 “Quality requirement in welding”** specifies the activities and requirements to ensure the welding quality. State and describe at least **TEN (10)** activities and requirements specified in the standard.
(10 Marks)

Question 6

- a). Please describe the planning for test and inspection (ITP) and explain why it is important for planning.
(5 Marks)
- b). The main matters of welding fabrication planning and management can be categorized by each of the **4M factors** as follows: **Materials**, **Machine**, **Methods** and **Man**. Please explain each of them.
(10 Marks)
- c). Planning of equipment is one of the essential item in project planning so that allotment of volume of work is balanced in the schedule and between fabrication processes. Please describe what are the essential item to be considered in the planning of equipment.
(10 Marks)

END OF QUESTIONS