



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2014 SESSION

SUBJECT CODE : FGB40103
SUBJECT TITLE : JIGS & FIXTURES DESIGN
LEVEL : BACHELOR
TIME / DURATION : 9.00 AM – 12.00 PM
(3 HOURS)
DATE : 5 JANUARY 2015

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 three (3) question only.
 6. Answer all questions in English.
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THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

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

Question 1

- (a) Describe *fixture* in details. (4 marks)
- (b) Describe drilling jigs with its components. (5 marks)
- (c) Locator is essential component in jig. Explain the functions of *locator* in a jig. (4 marks)
- (d) State the advantages of using screw clamps in jigs design. (3 marks)
- (e) Discuss **two (2)** advantages of using jigs and fixtures in manufacturing. (4 marks)

Question 2

- (a) Tool designer must initiate a predesign analysis before fabricating the jigs and fixtures. Determine **six (6)** important criteria in predesign analysis for the whole process. (6 marks)
- (b) Describe the importance of ergonomics in jigs and fixtures design. (4 marks)
- (c) Safety is one of the important considerations in designing a tool. Determine down **six (6)** safety consideration in tool design. (6 marks)
- (d) Explain assembly and detail drawing in jigs and fixtures design. (4 marks)

SECTION B (Total: 60 marks)**INSTRUCTION: Answer THREE (3) questions only.****Please use the answer booklet provided.****Question 3**

- (a) Compare head and headless renewable bushings in detail. (5 marks)
- (b) Discuss the three (3) installation methods for drill bushings. (6 marks)
- (c) Describe **two (2)** general forms of tool bodies. (4 marks)
- (d) Evaluate the advantages of using preformed materials for tool body. (5 marks)

Question 4

Refer to Figure 1 to answer question 4 (a), (b), (c), and (d).

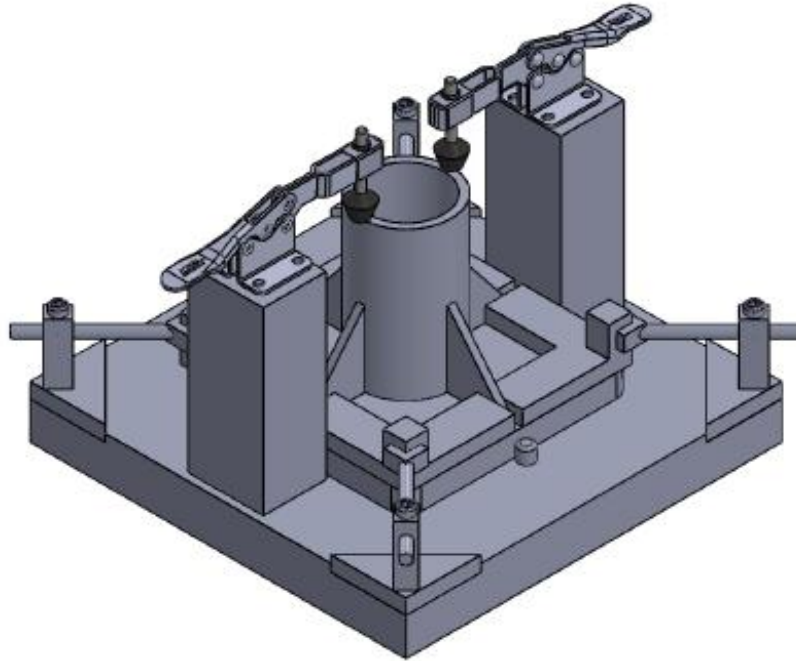


Figure 1

- (a) Evaluate the clamping devices design in Figure 1. Recommend the best design for the clamping system. (6 marks)
- (b) By assess this current jig design, explain whether the jig is capable to do its work. (4 marks)
- (c) Analyze further improvement for the jig in term of manufacturability. You can sketch the improved design for easier explanation. (6 marks)
- (d) Based on Figure 1, there are no fastening systems in the design. Suggest the best fastening method/ design for the fastenings system in the jig. You are advised to sketch to assist your explanation. (4 marks)

Question 5

- (a) Explain non mechanical clamps. (2 marks)
- (b) Describe the advantages of non mechanical clamps. (3 marks)
- (c) Evaluate the suitable clamp system in detail, if the workpiece requires a milling or slotting process on a milling machine. (6 marks)
- (d) Describe **two (2)** types of clamps in detail. (4 marks)
- (e) Discuss the alternatives method of clamping if the product is in odd shapes. (5 marks)

Question 6

- (a) Describe two (2) types of jigs in welding process. (4 marks)
- (b) Analyze the purpose of backup bars in welding jigs. (6 marks)
- (c) Explain the purpose of clamping supports in welding jigs. (4 marks)
- (d) A welding jig is heavy and big. The welding jig needs to be transfer / move from one place to another place depends on the production requirement. Evaluate the problem that will occur and recommend a design features that can be added on the welding jigs. You can sketch to elaborate the answer. (6 marks)

END OF QUESTION