



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
JANUARY 2014 SESSION**

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**SUBJECT CODE : FGB40103**  
**SUBJECT TITLE : JIGS & FIXTURES DESIGN**  
**LEVEL : BACHELOR**  
**TIME / DURATION : 3 HOURS**  
**DATE :**

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

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**SECTION A (Total: 40 marks)****INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1**

- (a) Define *jigs and fixtures*. (4 marks)
- (b) Describe in details the usage of fixed renewable bushing in jigs and fixtures. (5marks)
- (c) Dowel pins are essential component in jig assembly. Discuss the functions of *dowel pins*. (4 marks)
- (d) List the advantages of using *hook clamps* in jigs and fixtures (3 marks)
- (e) State TWO (2) types of material that being used in casting for special clamping purposes. (4 marks)

**Question 2**

- (a) Define TWO (2) types of tolerance in details. (4 marks)
- (b) Describe THREE (3) types of fits in jigs and fixtures. (6 marks)
- (c) List down FOUR (4) types of materials used for jigs and fixtures. (4 marks)
- (d) Discuss the importance of using jigs and fixtures in the industry. (6 marks)

**SECTION B (Total: 60 marks)**

**INSTRUCTION: Answer THREE (3) questions only.**

**Please use the answer booklet provided.**

**Question 3**

- (a) The function of a clamp is to hold a part against the locators during the machining cycle. Analyze the advantages and disadvantages of clamping in the Figure 1.

(5 marks)

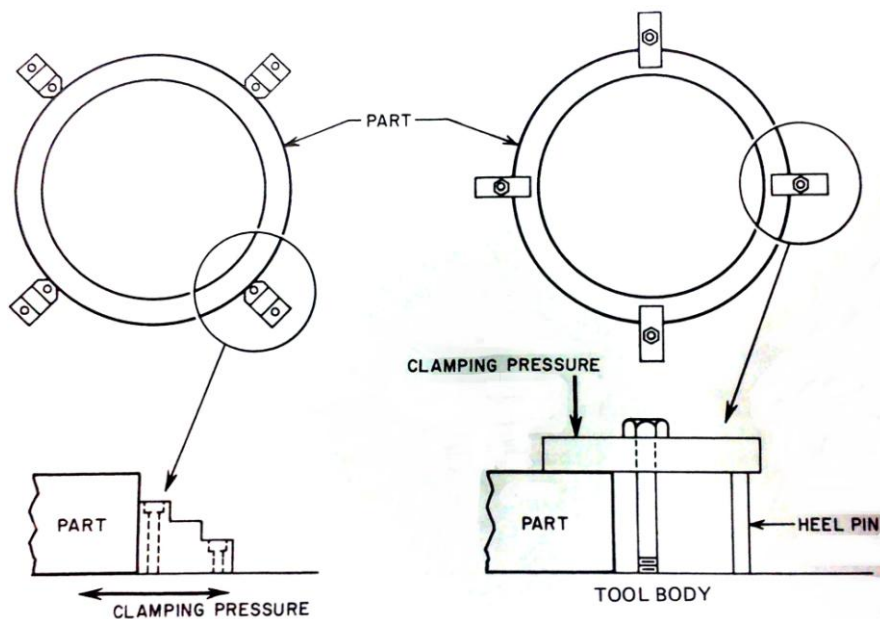


Figure 1

- (b) Differentiate the advantages and disadvantages of vacuum vises and magnetic vises.

(6 marks)

- (c) Explain the importance of tool forces during drilling process in jig design.

(4 marks)

- (d) A company requires to produce 1000 parts and deliver it within one (1) month to the customer. As a tool designer, choose the best type of clamp in order to achieve the company target. Asses and discuss your best solution for the types of clamp that required to achieve the target.

(5 marks)

#### Question 4

- (a) Define preformed materials for tool bodies in jigs and fixtures and list three **(3)** most common preformed materials to construct the tool bodies.

(5 marks)

- (b) Discuss the consideration for installing drill bushing.

(5 marks)

- (c) If a tool designer estimated the jigs weight is about 40kg, evaluate the important criteria that need to be considered in the design? Sketch and give your explanation.

(5 marks)

- (d) Compare the TWO (2) types of drill bushings.

(4 marks)

**Question 5**

- (a) State THREE (3) basic feature control symbols that normally found in tool design drawings and describe ONE (1) feature control symbols in detail. (5 marks)
- (b) List down THREE (3) procedures in making simplified drawings. (3 marks)
- (c) Describe the term 'Assembly drawings'. (3 marks)
- (d) Discuss MMC and LMC in tool drawings (4 marks)
- (e) Sketch and name FIVE (5) geometric characteristic symbols. (5 marks)

**Question 6**

As a tool designer, you are required to **sketch a milling fixture in an isometric view** for part as shown in Figure 2. The milling fixture must fulfill the following requirements of:

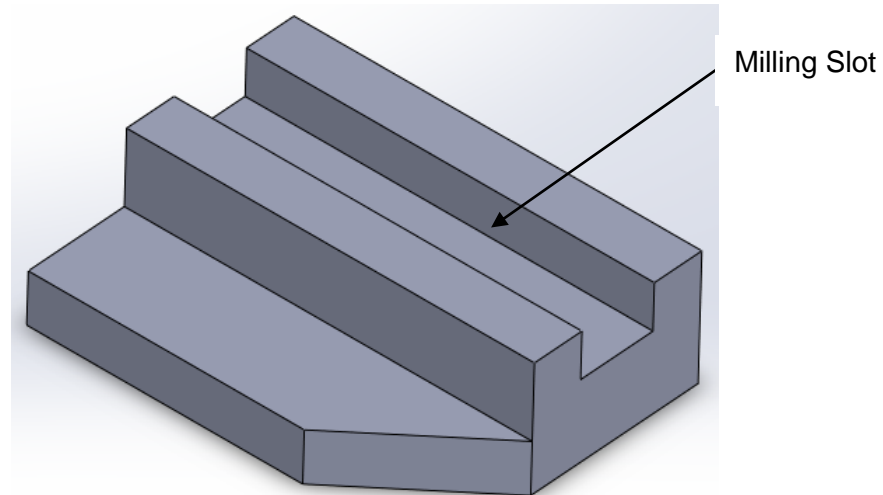


Figure 2

- a) Your fixture design able to perform the milling slot process and the design must consist with three (3) main elements. Explain your design in details.

(15 marks)

- b) Your design must consider the most suitable clamping device and rigid to withstand the force during milling process.

(5 marks)

**END OF QUESTION**