



**UNIVERSITI KUALA LUMPUR**  
**Malaysia France Institute**

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**FINAL EXAMINATION**  
**JANUARY 2010 SESSION**

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**SUBJECT CODE** : FMB 11302  
**SUBJECT TITLE** : MACHINE ELEMENTS  
**LEVEL** : BACHELOR  
**TIME / DURATION** : ~~12.30pm - 3.00pm~~  
1.00pm - 3.30pm  
( 2.5 HOURS )  
**DATE** : 29 APRIL 2010

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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 SIX (6) questions. Answer FOUR (4) questions only.
6. Answer ALL questions in English.

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THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

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**INSTRUCTIONS: Answer only FOUR (4) questions.**

**Please use the answer booklet provided.**

**Question 1**

Sketch a simple diagram of the following chains. Also, briefly explain their main functions:-

- (a) roller chain (9 marks)
- (b) silent chain (8 marks)
- (c) engineering-class chain (8 marks)

**Question 2**

- (a) Sketch a simple diagram and explain the following sprockets:-
  - i. type B hub sprocket (5 marks)
  - ii. type D hub sprocket (5 marks)
- (b) Briefly describe the main function of the following gears:-
  - i. worm gears (7 marks)
  - ii. bevel gears (8 marks)

**Question 3**

- (a) Explain the following gear drive definitions:-
- i. thermal power (5 marks)
  - ii. service factor (5 marks)
  - iii. gear ratio (5 marks)
- (b) Describe the main features of the 'electrical-type' adjustable speed drive. (10 marks)

**Question 4**

- (a) Assuming that there are two gears 750 cm from their center axes and connected in a drive system with 23 and 45 teeth respectively. Calculate the module of the drive. Also draw a simplified diagram of the drive system. (13 marks)
- (b) The transmission ratio of a gear system is 12 : 13 and the driving gear is running at a speed of 500 rps. Sketch a diagram and find the driven gear revolution speed. (12 marks)

**Question 5**

- (a) Describe the basic steps and features of performing 'laser alignments' on shafts. (13 marks)
- (b) Explain the following terms:-
- i. angular misalignment (6 marks)
  - ii. parallel misalignment (6 marks)

**Question 6**

(a) Explain the following types of brakes:-

i. friction disk brakes

(6 marks)

ii. electric brakes

(7 marks)

(b) Describe briefly the following types of clutches:-

i. fluid clutches

(6 marks)

ii. torque limiting clutches

(6 marks)

**END OF QUESTION**