



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
JANUARY 2010 SESSION**

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**SUBJECT CODE** : FVD 10203  
**SUBJECT TITLE** : CHASSIS AND BRAKING SYSTEM 1  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 3.00pm – 5.00pm  
( 2 HOURS )  
**DATE** : 30 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 questions paper consists of **TWO (2)** sections. Section A and B. Answer **ALL** questions in Section A. For section B answer **ONE (1)** question only.
6. Answer all questions in English.

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**THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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## SECTION A (Total: 75 marks)

**INSTRUCTION: Answer ALL questions.**

**Please answer on question paper.**

### Question 1

(a) Steering system consist of three major components. List those **three** components and explain the function of each component.

(6 marks)

(b) (i) Explain what is steering ratio?

(ii) Differentiate between constant steering ratio and variable steering ratio.

(6 marks)

(c) Explain the operation of a rack and pinion box steering system.

(5 marks)

(d) A customer has complained of an excessive play or looseness in steering system. The customer noticed a delay occurring during cornering or while doing maneuvers.

i. What are the possible causes of this problem?

(3 marks)

ii. What are the necessary corrections that should be taken in order to solve the problems (i) above?

(3 marks)

## Question 2

- (a) Describe the differences between regular spring and heavy duty spring in liner rate design coil spring?  
(6 marks)
- (b) (i) Describe the operation of mono tube hydraulic shock-absorber (damper) and also  
(ii) Explain TWO advantages of gas-filled shock absorber compare to hydraulic shock- absorber.  
(6 marks)
- (c) Stabilizer bar is a device used with the basic suspension components to provide additional stability.  
i. Describe how the device operates.  
ii. Explain what the possible effect if the diameter of stabilizer bar too small.  
(6 marks)
- (d) A service technician has removed and replaced the Macpherson struts. After this procedure, the wheel alignment was not in the specification.  
i. What are the possible causes of this problem?  
(3 marks)  
ii. What are the necessary corrections that should be taken in order to solve the problems (i) above?  
(4 marks)

## Question 3

- (a) Explain the effect of **Frictional Contact Surface (FCS)** to braking performance.  
(4 marks)
- (b) (i) What is the primary and the secondary shoes for non servo drum brakes?  
(ii) With the aid of a sketch, explain the operation of a non servo type drum brake system.  
(6 marks)

- (c) Describe the operation of floating caliper in brake disc system.  
(6 marks)
- (d) The purpose of master cylinder is to convert the mechanical force of operator's foot to hydraulic force. What is a compensating port in the master cylinder?  
(2 marks)
- (e) A vehicle with 130,000 km on it is producing a scraping noise on the rear right brake when it is raining or very damp outside.
- i. Give two possible causes of this problem?  
(4 marks)
- ii. What are the necessary corrections that should be taken in order to solve the problems (i) above?  
(3 marks)

## SECTION B (Total: 25 marks)

**INSTRUCTION: Choose only ONE(1) question to answer**

**Write your answer inside this question booklet.**

### Question 1

(a) Explain these terms:-

(12 marks)

i. Ride height

ii. Camber

iii. Caster

iv. Toe

(b) Explain in detail the procedure to perform four wheel alignment adjustments for Proton Wira 1.6 XLi by using John Bean Aligner Machine.

(10 marks)

(c) Translate this rim sizes code: **5 1/2 - JJx13 4 114.3 15**

(3 marks)

### Question 2

(a) Describe the procedure of coil spring servicing.

(5 marks)

(b) List TWO several advantages of using fiber composite leaf springs?

(4 marks)

(c) What is a Shock-Assist Shock Absorbers?

(4 marks)

(d) Explain the procedure to remove coil spring from Macpherson Suspension unit.

(8 marks)



(e) While driving down on the road, the customer hears a noise from the rear suspension system.

i. Give TWO the possible causes of this problem?

(4 marks)

### Question 3

(a) Describe how frictions play as a part in controlling the vehicle in braking system.

(5marks)

(b) Describe the characteristic of non-asbestos brake lining friction material.

(4 marks)

(c) (i) What is DOT for brake fluid?

(ii) What is the different between DOT 3, DOT 4 and DOT 5?

(6 marks)

(d) What is the purpose of metering and proportioning valve for brake system?

(4 marks)

(e) As the operator applied the brakes, the brake seems to be very spongy and soft.

i. Give THREE possible causes of this problem?

(3 marks)

ii. What are the necessary corrections that should be taken in order to solve the problems (i) above?

(3 marks)

END OF QUESTION