Document No : UniKL MFI_SD_AC41
Revision No: 02
Effective Date: 01 December 2008

CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2011 SESSION

SUBJECT CODE	:	FVB 20803
SUBJECT TITLE	:	CHASSIS TECHNOLOGY 2
LEVEL	:	BACHELOR
TIME / DURATION	:	12.30pm – 2.30pm (2 HOURS)
DATE	:	12 MAY 2011

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 two (2) question only.
6. Answer all questions in English.

THERE ARE 7 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

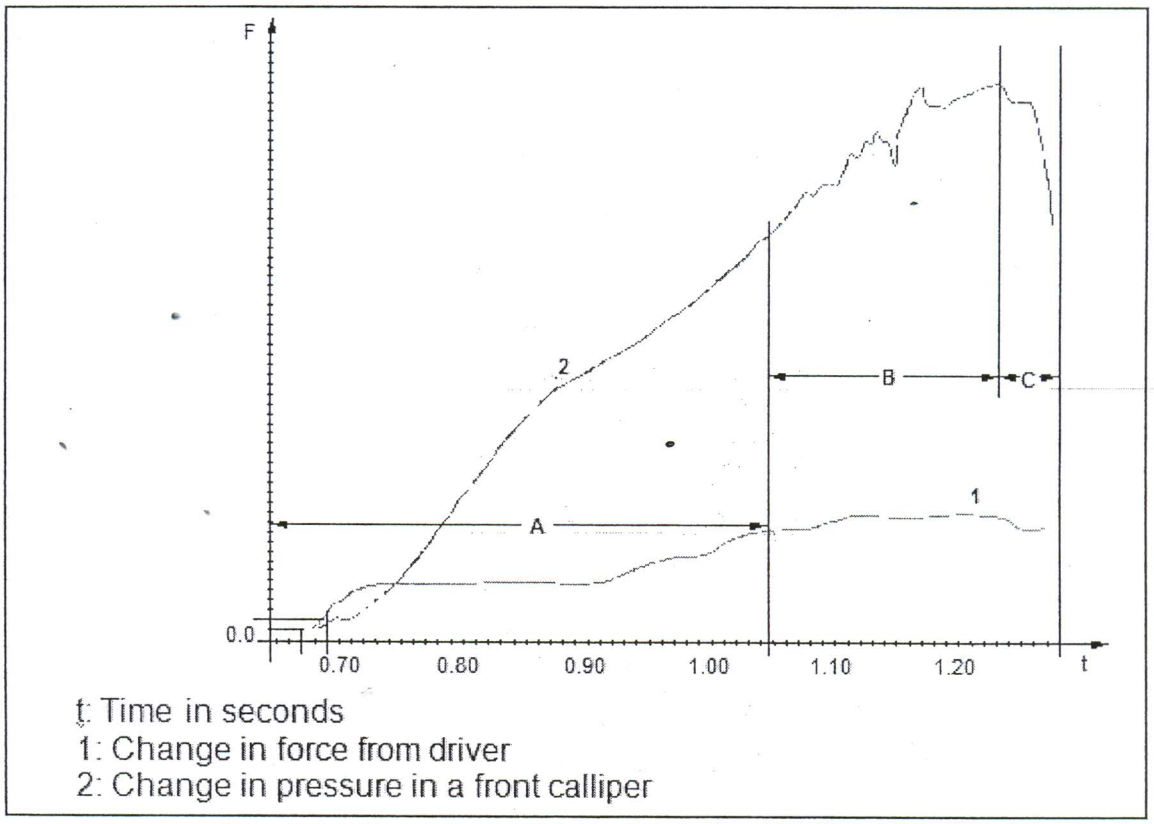
SECTION A (Total: 40 marks)

INSTRUCTION: Answer all the question.

Please use the answer booklet provided.

Question 1 (10 marks)

a)



Graph 1:- Pedal Force (F) Vs Changing of Time (t)

The above graph shows the change in pressure in a front calliper as a function of time and the force exerted by the driver on the brake pedal when emergency braking.

a) Explain the action taken by the driver at Zone A. (4 marks)

b) Why the pressure in a front calliper keeps increasing at Zone B? (4 marks)

c) Why the pressure in a front calliper falls at Zone C? (2 marks)

Question 2 (18 marks)

a) What is the advantages Electronic Stability Program (ESP) compared to Antilock Braking System (ABS)? (8 marks)

b) Explain with an aid of diagram, how does the ESP function can avoid the vehicle from understeer situation. (6 marks)

c) List down 4 MAIN components for ESP system and explain EACH of it. (4 marks)

Question 3 (12 Marks)

a) Explain the principle of hydropneumatic system that has been applied to Citroen Car Suspension Unit. (2 marks)

b) What is the purpose of the Safety Valve for the hydropneumatics suspension system? (4 marks)

c) The lower the normal frequency of spring, the larger the wheel movements become and make the suspension system more comfort. Why? (6 marks)

SECTION B (60 marks)

INSTRUCTION: Answer TWO (2) questions only

Question 3 (30 marks)

a) What is the advantages of Hydropneumatic Suspension System compared to Conventional Suspension System? (6 marks)

b) Explain how the Height Corrector unit can maintain the car height even there is an increasing of weight inside the car? (12 marks)

c) Explain the operation of the BX Hydractive Suspension System in figure 1 below. (12 marks)

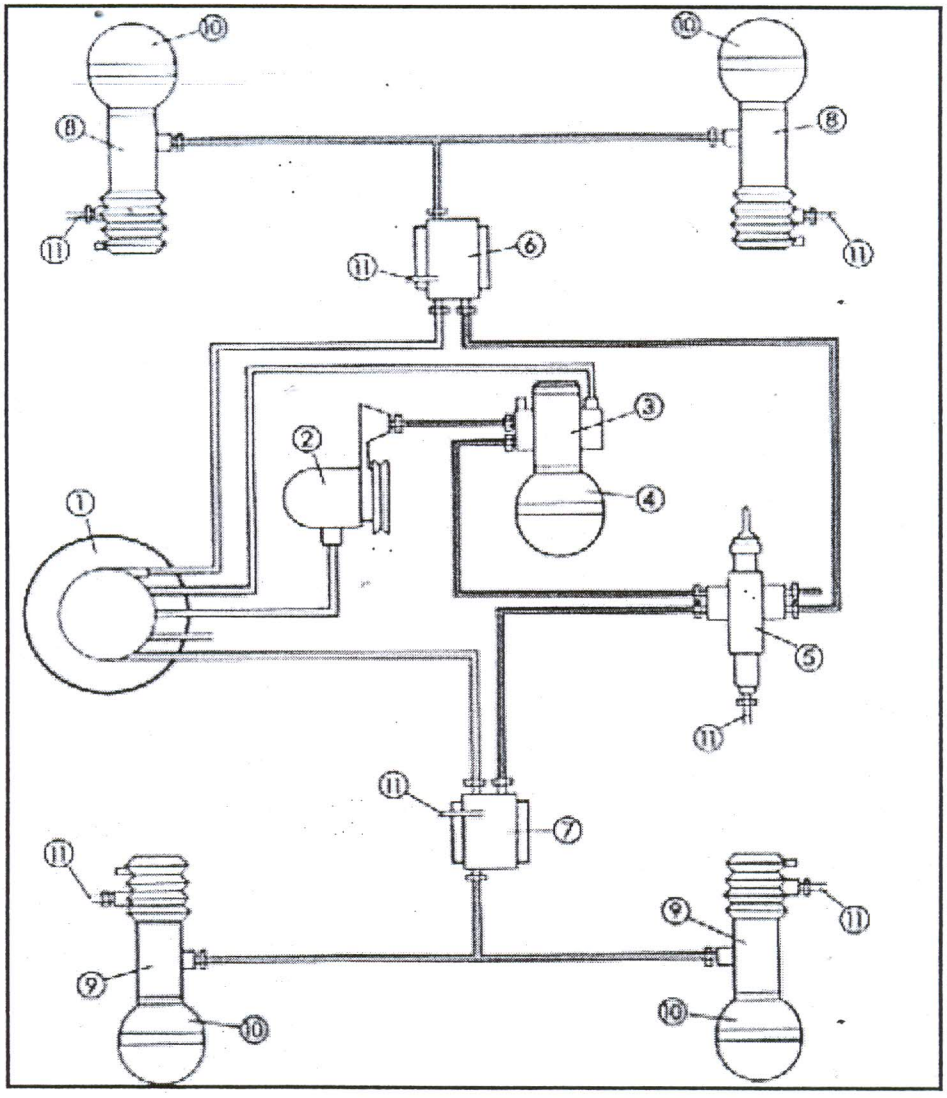


Figure 1:- Hydraulic Suspension System layout

Question 4 (30 Marks)

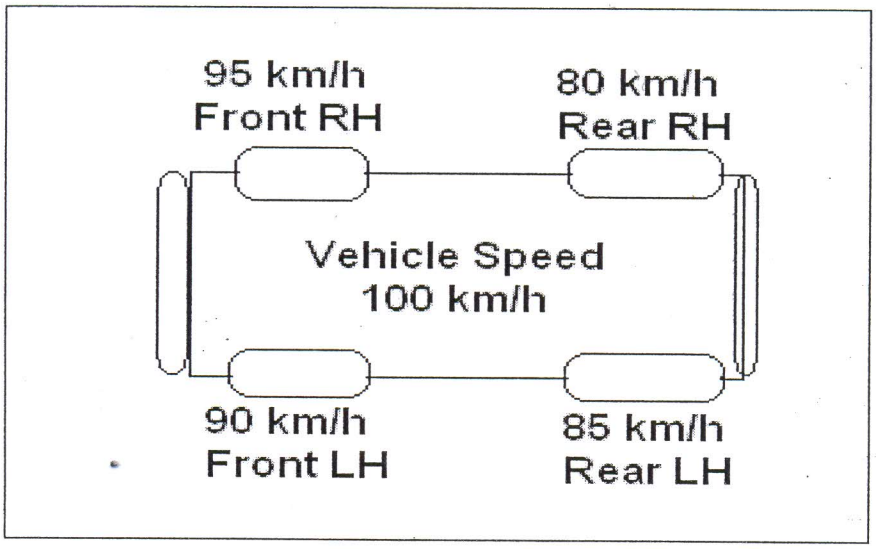


Figure 2 : Wheel speed & Vehicle speed of vehicle

By referring to the figure 2 above, answer the following questions:-

a) Why there is a difference between vehicle speed and the wheel speed? Explain it.

(5 marks)

b) Calculate the slip ratio for each wheel.

(8 marks)

c) How does the Electronic Brake Distribution(EBD) system work in this condition?

(7 marks)

d) Figure 3 below shows that the system layout of the ABS operation which is in "Still Position".

Explain by the aid of new system layout of the ABS operation if one of the tyre is slip.

(10 marks)

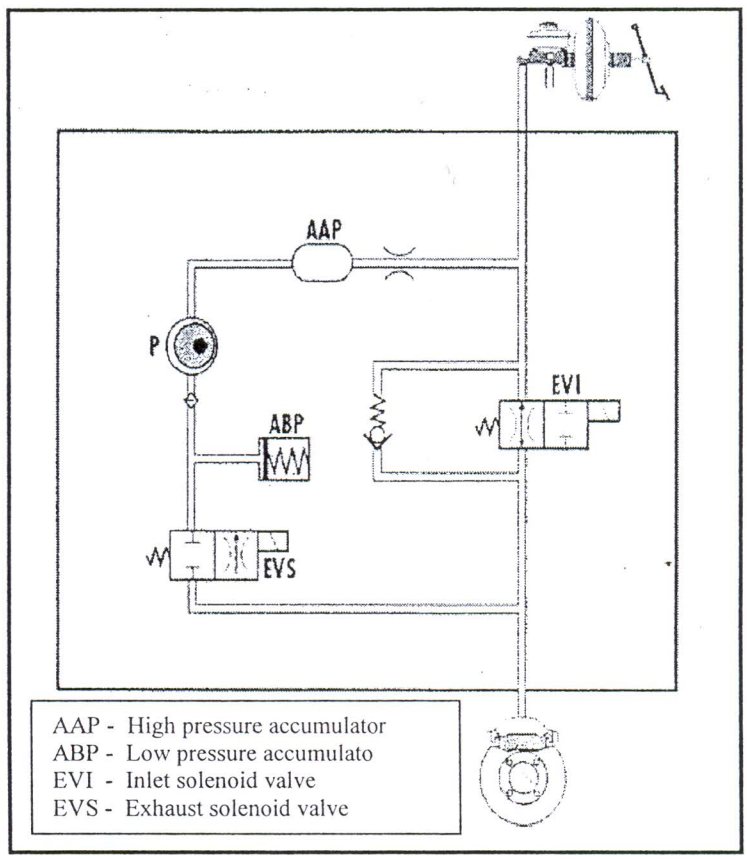


Figure 3: ABS System Layout - Still operation

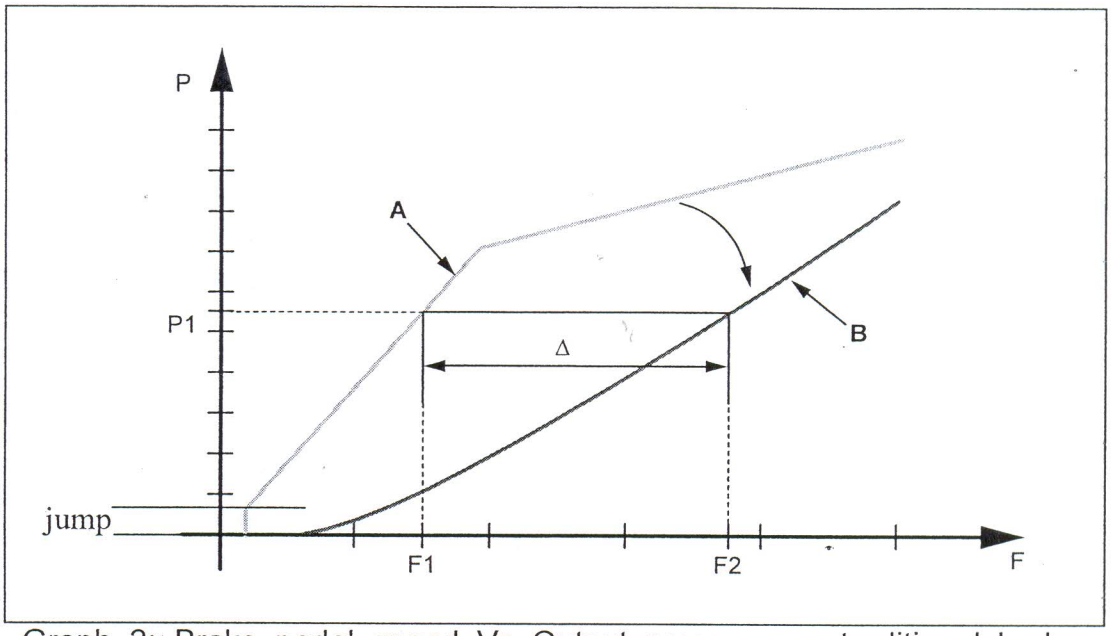
Question 5 (30 Marks)

From the graph 2 below;

a) Explain why the pressure is maintained at P1 during slow and fast braking on the traditional brake servo? (4 marks)

b) Why there is a "jump" at the earlier stage of braking?

(2 marks)



Graph 2: Brake pedal speed Vs Output pressure on traditional brake servo

F: Input force in daN on the control rod

P: Output pressure in bars in the master cylinder

A: Slow speed curve (10 daN/s)

B: Fast speed curve (1500 daN/s)

Δ: Difference in force

c) What is the difference between Brake servo using emergency valve assistant and Traditional brake servo?

(8 marks)

d) A driver applies 45 kg of force to a brake pedal that is connected to the master cylinder through a brake pedal lever having 4.0 :1 ratio. The master cylinder piston has a diameter of 15mm. Refer to the figure 4 below:

i) How many Newtons of force being applied to the master cylinder piston?

(4 marks)

ii) How much pressure is being generated in the braking system?

(4 marks)

iii) Find the force produced by a 30mm diameter wheel cylinder.

(4 marks)

iv) What is the pressure is being generated in the braking system if the system use the Emergency Valve Assistant? (4 marks)

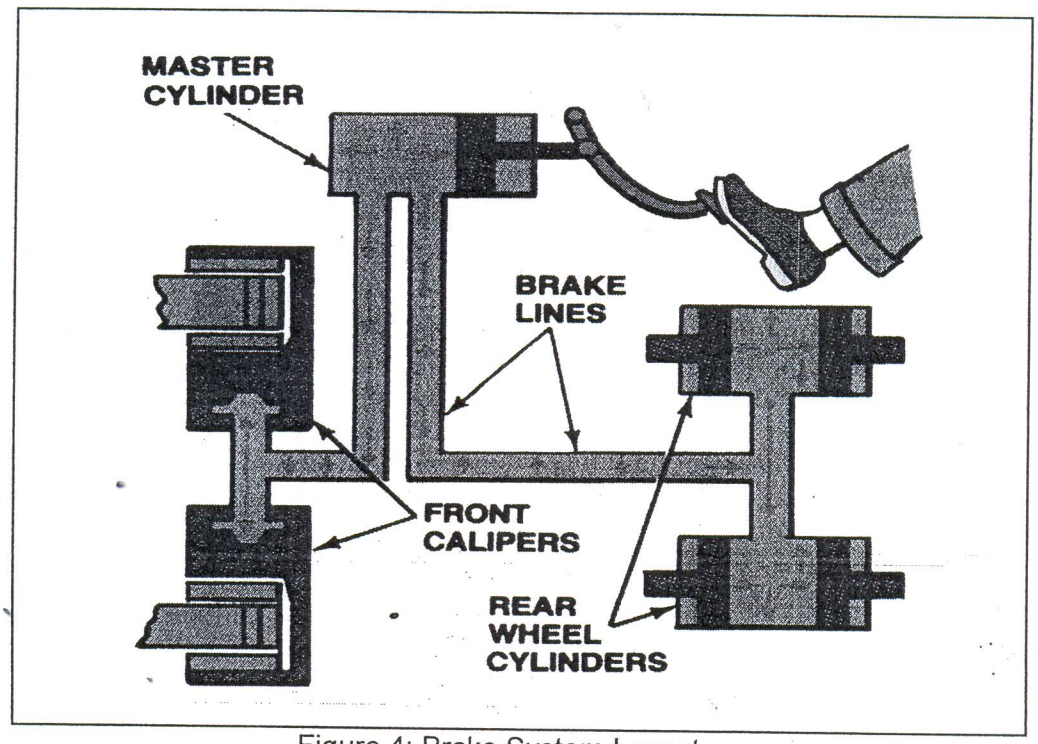


Figure 4: Brake System Layout

END OF QUESTION