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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JULY 2010 SESSION

SUBJECT CODE	:	FVB 20803
SUBJECT TITLE	:	CHASSIS TECHNOLOGY 2
LEVEL	:	BACHELOR
TIME / DURATION	:	9.00 am – 11.00 am (2 HOURS)
DATE	:	20 NOVEMBER 2010

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 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

INSTRUCTION: Answer all the question.
Please use the answer booklet provided.

Question 1 (20 marks)

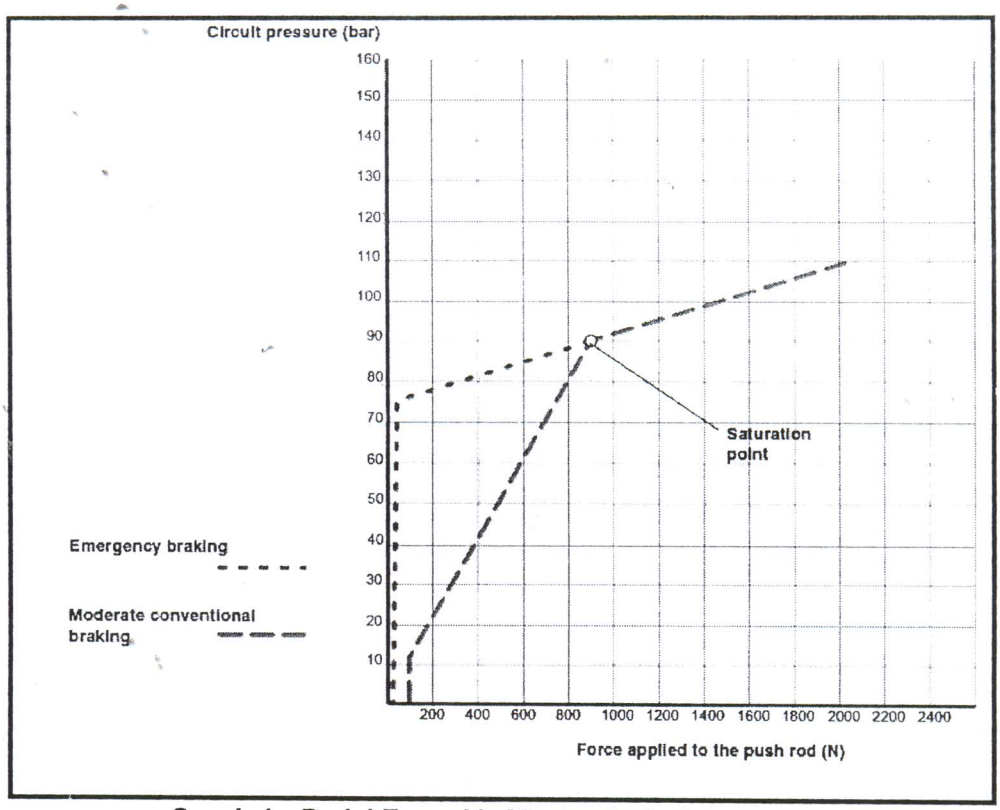
a) List 4 different between ***Emergency Braking Assistant and Conventional Braking***.

(8 marks)

b) WHEN and HOW the ***Emergency Valve Assistant*** playing their role?

(6 marks)

c)



Graph 1:- Pedal Force Vs Master Cylinder Pressure

What could you understand from the graph 1 above?

(6 marks)

Question 2 (20 marks)

a) What is the different between Electrical power steering system with Electrical hydraulic assisted steering System? (4 marks)

b) List 4 components for Electric Power Steering System and explain the function all the components. (4 marks)

c) Explain 2 safety precaution that electrical power steering E.C.U will take action if:-

i) full-lock position and steering assist reaches a maximum (4 marks)

ii) the electrical power steering motor have a problem (6 marks)

SECTION B (60 marks)

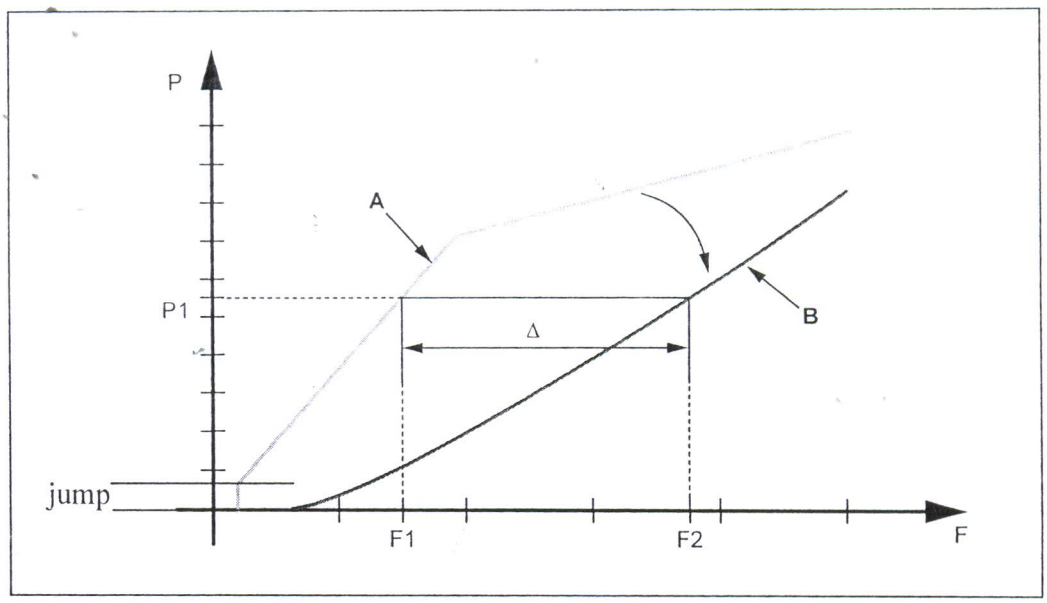
INSTRUCTION: Answer TWO (2) questions only

Question 1 (30 marks)

From the graph 1 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? (4 marks)



Graph 1: 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) Are the Emergency Valve Assistant is compatible with Antilock Braking System? Why?

(6 marks)

d) A driver applies 390 N of force to a brake pedal that is connected to the master cylinder through a brake pedal lever having 5:1 ratio. The master cylinder piston has a diameter of 20mm. Refer to the Figure 2 below.

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

(4 marks)

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

(4 marks)

c) Find the force produced by a 35mm diameter wheel cylinder.

(4 marks)

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

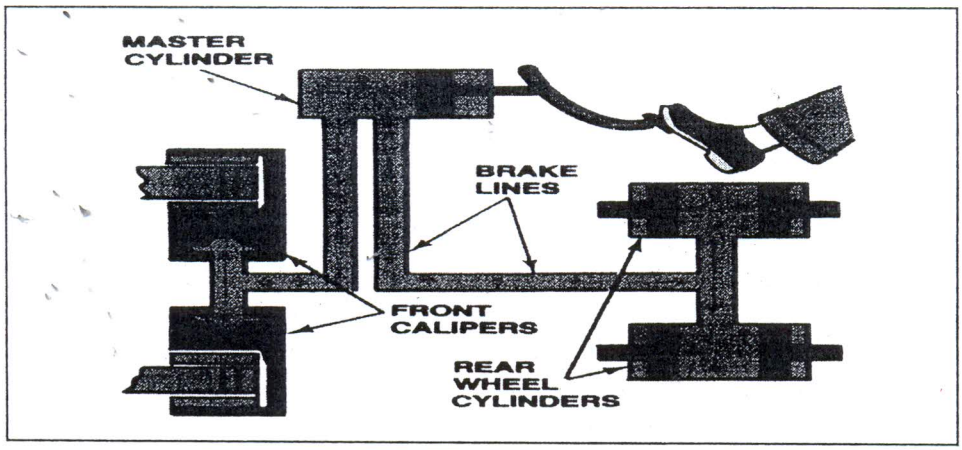


Figure 2: Brake system Layout

Question 2

a)

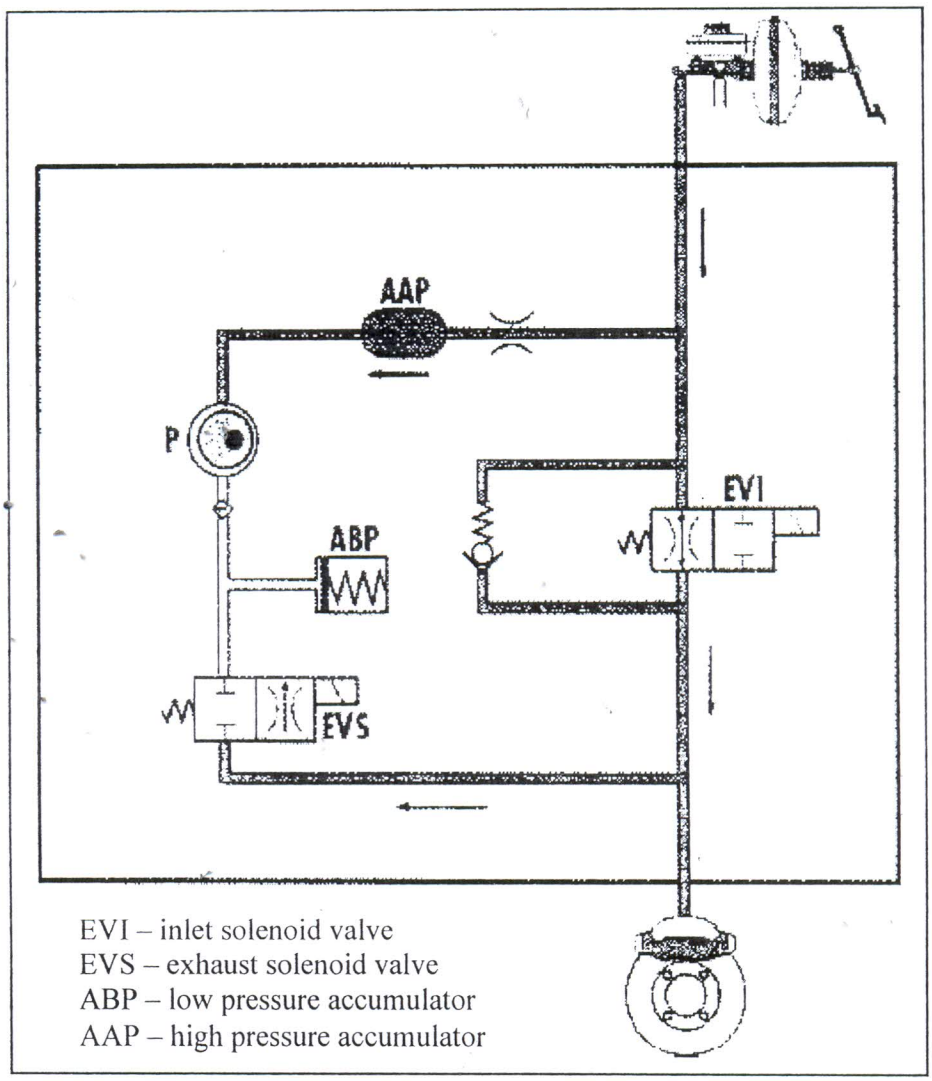


Figure 3: Braking without wheel locking

Figure 3 above shows the layout of the ABS (Antilock Braking System) during the wheel is not in locking condition.

You are asked to:-

i) Sketch the new layout if one of the wheels is in locking condition.

(8 marks)

ii) Explain the ABS operation if one or more wheels are lock.

(14 marks)

b) Is ESP (Electronic Stability Program) different from the ABS system? Why?

(8 marks)

Question 3

a) What is the benefit from the manufacturer's and environmental perspective, if they replaced the Hydraulic power steering system to Electric Power Steering system?

(10 marks)

b) What are the advantages using the Electric Power Steering compared to Hybrid Power Steering *(Hydraulic Pump run by Motor)*.

(8 marks)

c) Explain with the aid of diagram a basic operation for the Electric Power Steering System.

(12 marks)

END OF QUESTION