



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
JANUARY 2010 SESSION**

SUBJECT CODE : FVD 20102
SUBJECT TITLE : CHASSIS AND BRAKING SYSTEM 2
LEVEL : DIPLOMA
TIME / DURATION : 01.00 pm – 03.00 pm
(2 HOURS)
DATE : 29 APRIL 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 and Section B.
 6. Answer all questions in English.
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THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 30 marks)**INSTRUCTION: Answer ALL questions.**

1. Technician A said that one output from the Antilock Braking System Control Module is the hydraulic wheel circuit valves. Technician B said that one output from the Antilock Braking System Control Module is the brake warning lamp. Who is correct?
 - A. A only
 - B. B only
 - C. Both A and B
 - D. Neither A nor B

2. Antilock braking systems are designed to prevent wheel lockup under...
 - A. light braking condition
 - B. heavy braking condition
 - C. heavy loaded condition
 - D. lightly loaded condition
 - E. None of the above

3. At Pressure hold operation the Antilock Braking System Control Module send electrical currents to the...
 - A. wheel speed sensor
 - B. inlet solenoid valve
 - C. hydraulic motor
 - D. outlet solenoid valve
 - E. None of the above

4. CEMB Brake test machine is to test the...
 - I) Braking System
 - II) Engine System
 - III) Alignment System
 - IV) Suspension System
 - A. I, and II
 - B. I, III and IV
 - C. I, II and III
 - D. I, II, III and IV

5. Which of the following of spool valves changes passageways *by* rotating?
 - A. The sliding spool valve
 - B. The rotary spool valve
 - C. The positive displacement spool valve
 - D. The vane spool valve
 - E. None of the above

6. Which of the following is **not** a component of an antilock braking system?

- A. Wheel speed sensors.
- B. Pump and motor
- C. Antilock brake control module (ABCM)
- D. Anti – wear brake pad sensor
- E. None of the above

7. Why is a brake servo booster is fitted to modern vehicles?

- A. To gave pleasure to the driver when driving.
- B. To reduce the amount of pedal pressure that is necessary to stop the car
- C. To reduce the amount of pedal travel adjustment.
- D. To ensure the amount of pressure is maximise to the brake system.
- E. None of the above

8. What is **true** about Ovalisation in a CEMB Brake test machine?

- I) The value is expressed in %
 - II) It represents the fluctuation in the braking force
 - III) It shows the amount of friction without braking
 - IV) The operator will feel a rhythmic oscillation on the brake pedal
- A. I and II
 - B. I, II and III
 - C. I, II and IV
 - D. I, II, III and IV

9.

Front Left Wheel speed sensor	0km/h
Front Right Wheel speed sensor	0km/h
Rear Left Wheel speed sensor	0km/h
Rear Right Wheel speed sensor	0km/h
Warning light status	OFF
Engine RPM	0

Figure A; ABS Parameter in Diagnostic tool

In figure A, it can be assumed that the ABS Parameter in diagnostic tool is

- I) not moving while the ignition switch "OFF"
 - II) moving while the diagnostic tool is operating
 - III) not moving while the ignition switch is "ON"
 - IV) starting to move with the gear engage at D position
- A. I
 - B. II and III
 - C. III
 - D. IV

10. According to the CEMB brake test "**EUSAMA Recommendations**" the good rating of adherence value is

- A. > 45%
- B. 15% to 25%
- C. 25% to 45%
- C. < 25%
- E. None of the above

11. In the vacuum assisted braking system (diesel engine) the source of vacuum is from:-
- Inlet manifold
 - Exhaust manifold
 - Air compressor
 - Vacuum pump
 - None of the above
12. When a tire locks up completely during a stop, it is said that there is _____ slip.
- Minimum
 - 50%
 - None of the above
 - 100%
 - 25%
13. What does "Brake Feel" mean in brake servo...?
- This reaction force is directly proportional for pressure created within the master cylinder.
 - The movement of the valve plunger is transmitted to the valve operating rod on to the brake pedal.
 - The compressed rubber reaction disc transmits this reaction pressure to both the diaphragm plate and the valve plunger.
 - The pressure on the plunger valve tends to force it to the right (without moving the diaphragm plate), causing the valve to close off the atmospheric port.
- I and II
 - I, II and III
 - I,II,III and IV
 - II and III
14. The _____ is used to sense the speed of each wheel.
- Wheel speed sensor
 - Height sensor
 - Antilock brake control module (ABCM)
 - Tire puncture sensor
 - None of the above
15. In a brake servo system, what will happen to the "poppet valve" during Applied position?
- Poppet valve will close the vacuum port
 - Poppet valve will open the atmospheric port
 - Force from operating rod causes the poppet to close the vacuum port and open the atmospheric port
 - Force from the operating rod causes the valve plunger to leave the poppet valve and opens the atmospheric port.
- I and III
 - II and III
 - I,II,III and IV
 - I,II, and III

SECTION B (Total: 70 marks)

INSTRUCTION: Answer all THREE (3) questions.

Question 1

- a) Fill in the blanks with "ON" or "OFF" for the operation of the ABS according to their mode:-

Operation Mode	Solenoid Valve "IN"	Solenoid Valve "OUT"	Motor
Normal			
Hold	ON		
Reduce			OFF
Increase			

Figure 1: HCU Operation Mode

(12 marks)

- b) In CEMB Brake test **Rolling resistance** means... (6 marks)
- c) In CEMB Brake test **Ovalization** means.... (6 marks)

Question 2

Power assisted brake servo system, are currently fitted to all modern vehicles in the braking system.

- a) List **THREE (3)** advantages of this brake Servo over conventional type of brake system (3 marks)
- b) Explain how does the "**Holding Operation**" function in the Power assisted brake servo? (7marks)
- val - L P - 2PA
F L - 01 v
↓
C hok/A
- c) A "Customer Complains that the brake pedal feels very hard when it is applied and the brake response is not really effective."
As a technician, you are required to carry out a test on the power assisted brake servo.
Describe the suitable test method that can be applied (12 marks)

Question 3

- a) With the aid of a sketch, explain the operation of Flow Control Valve during High Speed. (10 marks)
- b) Results of brake test on Citroen Xsara 1.8

Brake	Front		Rear		Stationary Brake	
	Left	Right	Left	Right	Left	Right
Rolling resis N	203	150	66	102		
Ovalization %	3	0	9	11		
Max brake effect N	3116 3123		1054	961	1597 1433	
Force at max diff N	2424 2230		1028	900	1559 1292	
Weight	387	398	215	221		

Table 1 Xsara 1.8 test result

Find the percentage of Wander effect of front brake system and rear Adherence adopted? (10marks)

- c) List down 4 type of ABS system (4 marks)

100%

$$\frac{\text{brake}}{w \times 921} \times 100$$

$$\frac{2424 + 2230}{3116 + 3123} \times 100$$

END OF QUESTION