



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

---

**FINAL EXAMINATION  
JANUARY 2010 SESSION**

---

**SUBJECT CODE** : FVD 30202  
**SUBJECT TITLE** : TRANSMISSION 2  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 9.00am – 11.00am  
( 2 HOURS)  
**DATE** : 07 MAY 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 answer 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 TWO (2) questions only.
6. Answer all questions in English.
7. All gear ratio formula is appended.

---

THERE ARE 4 PAGES OF QUESTIONS AND 1 PAGE OF APPENDIX, EXCLUDING THIS PAGE.

---

**SECTION A (Total: 60 marks)**

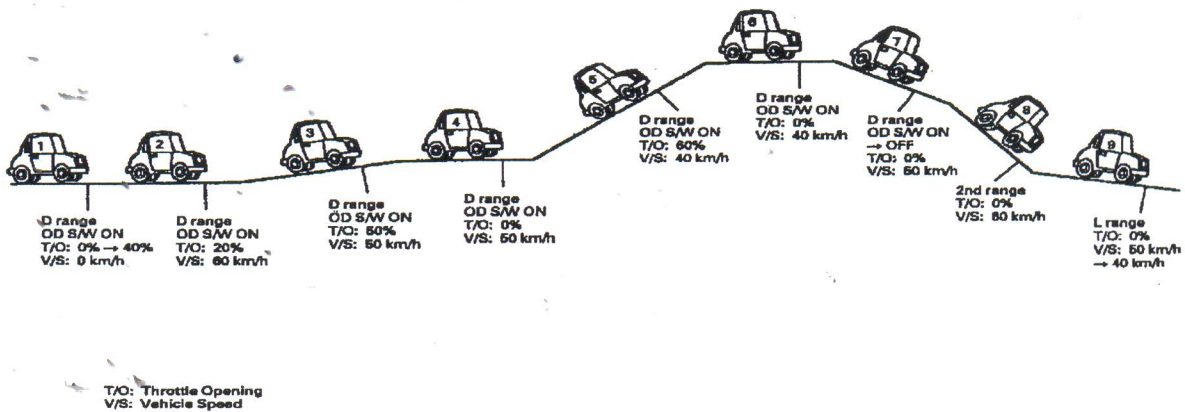
**INSTRUCTION: Answer ALL questions.**

**Please use the answer booklet provided.**

**Question 1**

a) Why IS the color of ATF (automatic transmission fluid) change from red to the brown?  
(5 marks)

b) By referring to figure 1 below, explain the condition of vehicle no. 8.  
(5 marks)



**Figure 1 : Vehicle running condition**

c) What are the possible causes that may lead to deteriorations of automatic transmission fluid?  
(5 marks)

d) What are the differences between the torque converter and fluid coupling?  
(5 marks)

**Question 2**

- a) List down **FIVE** conditions that simple planetary gear set is able to provide in the typical automatic transmission.  
(5 marks)
- b) What are the **TWO** types of pulse generators used in an automatic transmission and what are the functions for both of it.  
(5 marks)
- c) Write down **FIVE** main components of hydraulic operating units in four speed automatic transaxle (KF4A).  
(5 marks)
- d) Describe what the check valve is.  
(5 marks)

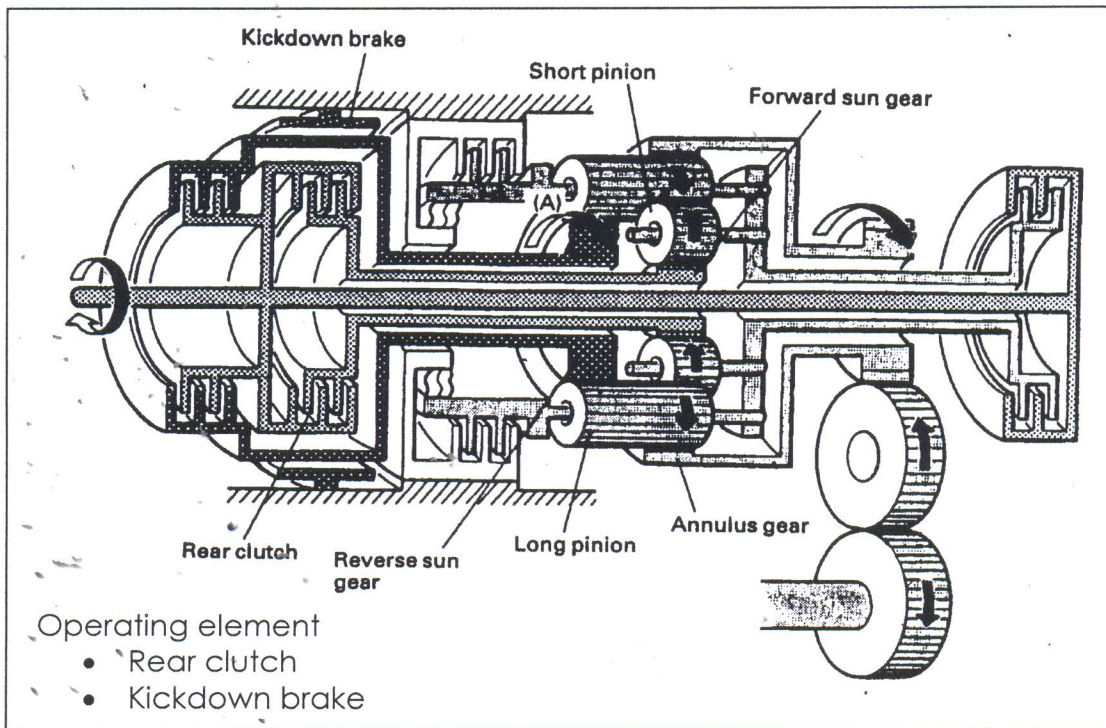
**Question 3**

- a) What are the two types of one way clutches used in automatic transmission and where the locations that the one way clutches are are fitted.  
(5 marks)
- b) Describe the construction of simple planetary gear set.  
(5 marks)
- c) Clearly explain the two types of brakes used in automatic transmission.  
(5 marks)
- d) What is the **FOUR** solenoid valves that are used to operate the typical automatic transmission system (KF4A)?  
(5 marks)

**SECTION B (Total: 40 marks)**

**INSTRUCTION: Answer TWO questions.**

**Question 1 -**



**Figure 2. operating element in typical automatic transmission**

a) By referring to figure 2, what is the gear position should be obtained and clearly explain how the gear position is can be achieved.

(10 marks)

b) If the number of annulus gear teeth is 74, forward sun gear is 26, reverse sun gear is 34, short pinion is 22 and long pinion is 20, calculate the gear ratio that will be obtained from the gear position that is achieved in question 1 (a).

(10 marks)

**Question 2**

- a) What are the purposes of converter stall test that should be performed during diagnose the automatic gear box problem and write down the complete procedures to perform the converter stall test  
(10 marks)
- b) Clearly explain what are the possible causes of the automatic transmission if the result of stall test is as below,
- i) Reading in "D" position above specification
  - ii) Reading in "R" position above specification
  - iii) Reading in both "D" and "R" position below specification
- (10 marks)

**Question 3**

- a) What is the safety mechanism that usually equipped with automatic transmission vehicle and clearly explain how is the system works?  
(10 marks)
- b) Describe the main components of Ravigneaux type planetary gear set and clearly explain the construction and arrangement of the entire parts as a single unit of planetary gear set.  
(10 marks)

**END OF QUESTION**

Appendix

Gear ratio formula

$$\text{Speed Ratio} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

$$1^{\text{st}} \text{ Speed} = \frac{\text{ANNULUS}}{\text{FORWARD SUN GEAR}}$$

$$2^{\text{nd}} \text{ Speed} = \left[ \frac{\text{ANNULUS} \left( \frac{\text{Reverse Sun Gear}}{\text{FORWARD SUN GEAR}} \right) + \text{ANNULUS}}{\text{ANNULUS GEAR} + \text{REVERSE SUN GEAR}} \right]$$

$$3^{\text{rd}} \text{ Speed} = 1 : 1 \text{ ( Direct Flow )}$$

$$4^{\text{th}} \text{ Speed} = \frac{\text{ANNULUS}}{\text{ANNULUS} + \text{REVERSE SUN GEAR}}$$

$$\text{Reverse} = \frac{\text{ANNULUS}}{\text{REVERSE SUN GEAR}}$$

Gear ratio = (number of teeth sun gear + number of teeth annulus gear) / (number of teeth sun gear)

Gear ratio = (number of teeth sun gear + number of teeth annulus gear) / (number of teeth annulus gear)