



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2014 SESSION

SUBJECT CODE : FVD30202 / FVD24302
SUBJECT TITLE : TRANSMISSION 2
LEVEL : DIPLOMA
TIME / DURATION : 2.00 PM – 4.30 PM
(2.5 HOURS)
DATE : 5 JANUARY 2015

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
 2. This question paper is printed on one 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) questions only.
 7. Answer all questions in English
 8. All gear ratio formula is appended
 9. All question paper should be returned back to the invigilator
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THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1**

- a) List the main components of the automatic transmission.
(2 marks)
- b) Define the denotation of “OD” that equipped in some automatic transmission vehicle and explain the function of the OD button.
(5 marks)
- c) List down **THREE (3)** required properties of Automatic Transmission Fluid (ATF) to meet special requirements of automatic transmission operations.
(3 marks)
- d) Improper ATF filling can also cause the fluid level to be too low. Determine the problems that may happen if the fluid level is too low.
(5 marks)
- e) Explain the “Stall phase” that occurs in torque converter operation during transferring engine power to the drive wheel.
(5 marks)

Question 2

- a) Describe the Fluid Coupling and state the difference between Fluid Coupling and the Torque Converter.
(2 marks)
- b) Define the function of “one way clutch” that installed in Ravigneaux type planetary gear set.
(3 marks)
- c) List down the differences between manual gear box and automatic gear box.
(5 marks)

- d) Describe the main functions of 1–2 shift valves that are fitted in valve body of automatic transmission hydraulic system (KF4A).

(5 marks)

- e) Explain the operation of the automatic transmission when the shift pattern is selected from economy (normal) mode to power mode.

(5 marks)

Question 3

- a) Explain the operation of Ravigneaux type planetary gear set (KF4A) when the shift speed is in 1st gear (D).

(5 marks)

- b) State the correct procedures of performing the “torque converter stall test”.

(8 marks)

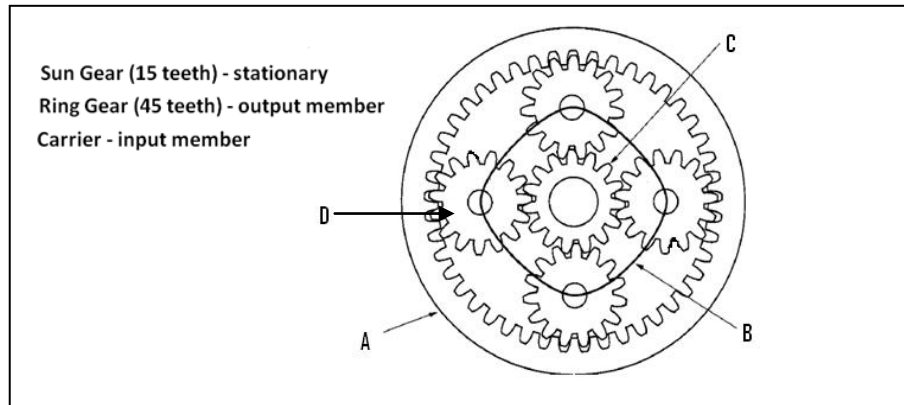
- c) In typical Ravigneaux type gear set consists of

- Long pinion (18 gear teeth).
- Short pinion (20 gear teeth).
- Forward sun gear (28 gear teeth).
- Reverse sun gear (36 teeth).
- Ring/annulus gear (78 gear teeth).
- Planet carrier.

Forward sun gear mesh is with short pinion and reverse sun gear mesh is with long pinion. Then the long pinion meshes with the short pinion and the annulus gear.

With **aid of sketch**, determine the **gear ratio** and the **direction of rotation** of output member when forward sun gear acts as driving member, annulus gear as output member and planet carrier is stationary.

(7 marks)

SECTION B (Total: 40 marks)**INSTRUCTION: Answer TWO questions only.****Question 1****Figure 1: simple planetary gear set**

- a) By referring to figure 2, identify all the **FOUR (4)** main components of planetary gear set.

(6 marks)

- b) Determine the direction of rotation of component **A** and **D** if the rotation of component **B** is clockwise.

(4 marks)

- c)
 i. Calculate the gear ratio that can be obtained from these planetary gear set combination.

(5 marks)

- ii. Determine the condition of gear that these planetary gear set can provide.

(5 marks)

Question 2

- a) Clearly describe the mechanical components below:

- i. Simpson planetary gear set.

(5 marks)

- ii. Ravigneaux planetary gear set.

(6 marks)

(7

- b) Customer complains that his vehicle that uses automatic transmission (KF4A) has a problem when shifting to “reverse” and “L” position but the transmission works satisfactorily in D position.

i) Identify the operating elements that operate in R and L position.

(5 marks)

ii) Determine the possible causes of the above problem.

(5 marks)

Question 3

a)

i) Determine the functions of fix orifice in automatic transmission hydraulic system.

(4 marks)

ii) By referring to figure 2 below clearly explain the operation and condition of the vehicle in the vehicle no. 5.

(6 marks)

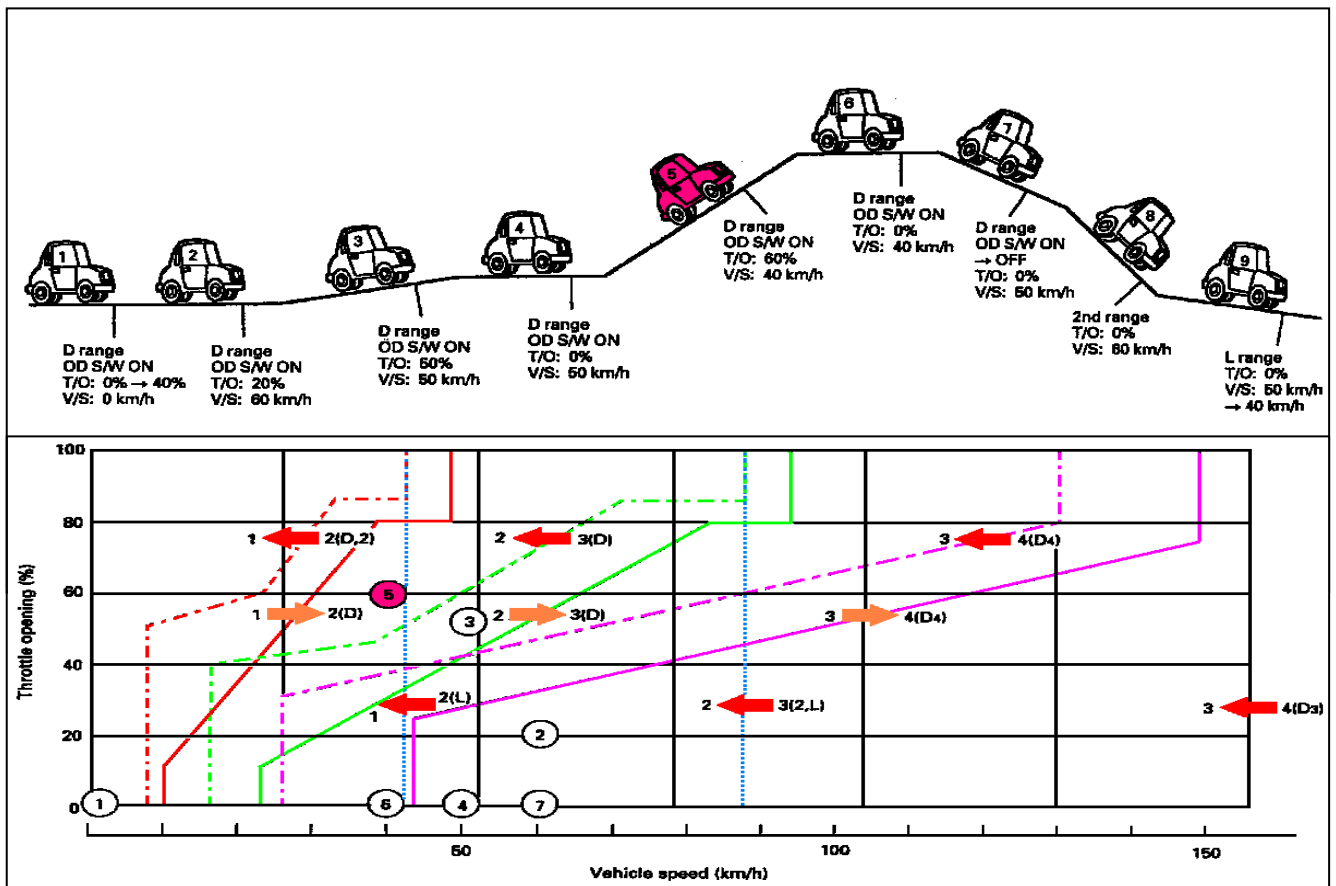


Figure 2: vehicle shift pattern chart

b)

i) State the purposes of “converter stall test”.

(4 marks)

ii) Determine the problem / symptom that may occur in automatic transmission operation if the actuators/sensors below are in failure.

- Shift Control Solenoid Valves.

(2 marks)

- Damper Control Solenoid Valve.

(2 marks)

- Pressure Control Solenoid Valve.

(2 marks)

END OF QUESTION