



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

MOTOR VEHICLE MECHANICS

SUBJECT: Transmission System Maintenance PAPER NO: 346/22/M05

DURATION: 3 Hours

MAY / JUNE 2024 EXAMINATION

REQUIREMENTS

Pen, drawing instruments and answer booklet

INSTRUCTIONS TO CANDIDATE

- 1. Section A: Answer all questions – (40 marks).**
- 2. Section B: Answer all questions – (60 marks).**

This paper consists of 4 printed pages.

SECTION A

QUESTION 1

- a) State three (3) types of manual transmission systems. (3 marks)
- b) State three (3) function of each of the following:
- i) Clutch (3 marks)
 - ii) Gear box (3 marks)
- c) List four (4) clutch faults. (4 marks)
- d) State two (2) functions of each of the following:
- i) Final drive unit (2 marks)
 - ii) Differential unit (2 marks)
- e) Explain the purpose of a sliding joint on a propeller shaft. (2 marks)

QUESTION 2

- a) Name the component on a four wheel drive vehicle gear box that enables transmission of torque to the front axle. (2 marks)
- b) Write down the formular for calculating the gear ratio for the reverse gear. (3 marks)
- c) State two (2) advantages and two (2) disadvantages of a hooke type joint. (4 marks)
- d) Describe how you would adjust pinion bearing preload on a final drive. (6 marks)
- e) Describe the power flow in a constant mesh gearbox when reverse gear is engaged. (6 marks)

SECTION B

QUESTION 3

- a) List four (4) alternative name of a clutch plate. (4 marks)
- b) With reference to clutch plates define the term crimping. (2 marks)
- c) State four (4) types of gears used on gear boxes. (4 marks)

QUESTION 4

- a) State two (2) alternative names of each of the following gearbox shafts.
 - i) Spigot shaft (2 marks)
 - ii) Lay shaft (2 marks)
 - iii) Main shaft (2 marks)
- b) Which gearbox ratio in a gear box provides the greatest torque ratio but with the lowest gearbox speed. (1 mark)
- c) Explain the purpose of a propeller shaft universal joint. (3 marks)

QUESTION 5

- a) Name the component in Figure 1. (2 marks)

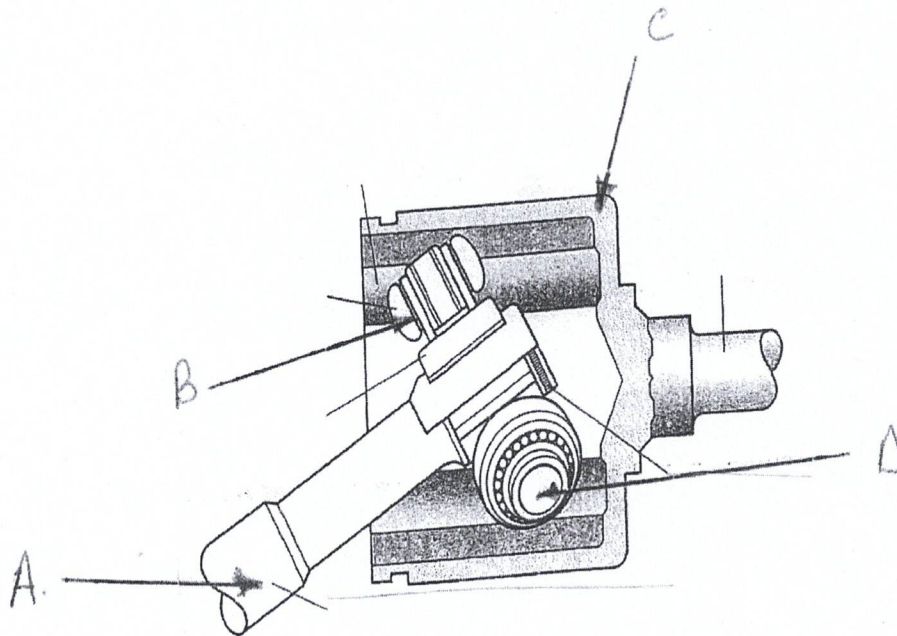


Fig 1

- b) Label the component A, B, C, and D. (8 marks)

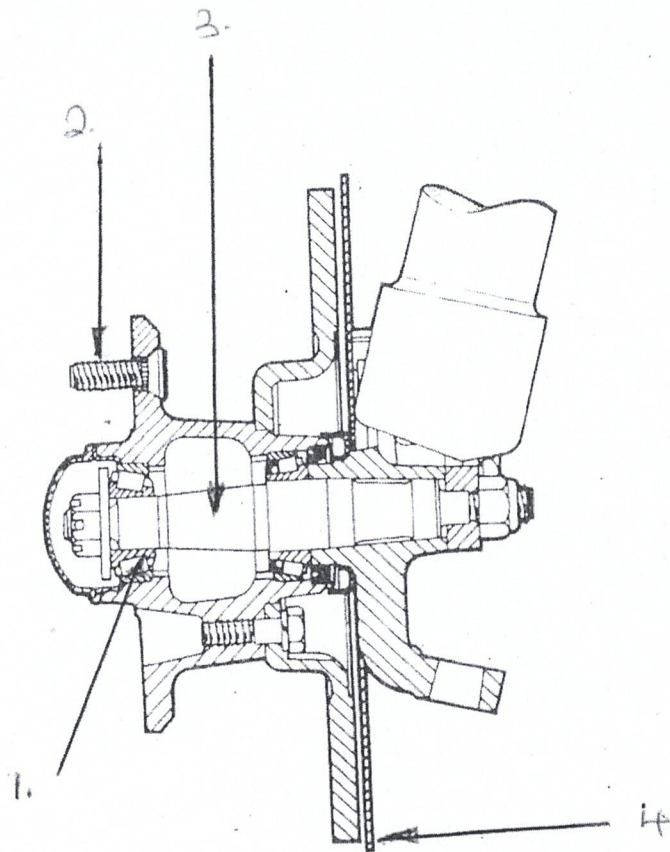
QUESTION 6

State any five (5) gearbox faults and state one cause for each. (10 marks)

QUESTION 7

- a) State any two (2) causes of propeller shaft vibration. (2 marks)
- b) Differentiate between a drive shaft and a half shaft. (4 marks)
- c) State two (2) advantages of a torque convertor. (2 marks)
- d) On a torque convertor, what term is used to describe a condition in which the turbine and impeller are turning at the same speed? (2 marks)

QUESTION 8



- a) Label components 1, 2, 3 and 4. (8 marks)
- b) Identify component above. (2 marks)

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