THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN TECHNICAL EDUCATION EXAMINATION

790 **AUTOMOBILE TECHNOLOGY**

Time: 3 Hour. **Monday, 10th May 2005 p.m.**

Instructions

1. This paper consists of **eight (8)** questions.
2. Answer any **five (5)** questions
3. Each question carries **twenty (20)** marks.
4. Programmable calculators, cellular phones and other unauthorized materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. (a) Explain five causes of abnormal engine noise and their effects on engine performance.

   (b) Describe the diagnostic steps a technician should take when an engine misfires during acceleration.

   (c) Outline the procedure for checking valve clearance in an overhead camshaft engine.

2. (a) Compare carburetor and electronic fuel injection (EFI) systems in terms of efficiency and control.

   (b) State four components of an EFI system and explain their functions.

   (c) Explain three reasons why fuel filters should be replaced regularly in a vehicle.

3. (a) Describe the process of clutch engagement and disengagement in a manual transmission system.

   (b) Explain the function and operation of a release bearing in a clutch system.

   (c) State three causes of clutch slippage and how each can be corrected.

4. (a) With the help of a diagram, explain the power flow in a four-speed manual gearbox.

   (b) Differentiate between synchromesh and constant mesh gears.

   (c) Describe the symptoms and causes of worn-out gearbox bearings.

5. (a) State four functions of the differential in a vehicle drivetrain.

   (b) Explain how limited slip differentials (LSDs) work and why they are used.

   (c) Describe the effects of driving with low differential oil level.

6. (a) Define bump steer and explain its causes in a steering system.

   (b) Explain the operation of a hydraulic power steering system.

   (c) State three advantages of electric power steering over hydraulic systems.

7. (a) Describe the working principle of a thermal-type coolant temperature sensor.

   (b) State three symptoms of a faulty engine coolant temperature sensor.

   (c) Explain how a thermostat regulates engine temperature.

8. (a) Outline the procedure for performing a compression test on a petrol engine.

   (b) State the acceptable compression variation between cylinders and its implications.

   (c) List three causes of low compression in an engine and how each can be addressed.