THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN TECHNICAL EDUCATION EXAMINATION

790 AUTOMOBILE TECHNOLOGY

Time: 3 Hour. **Monday, 11th May 2004 p.m.**

Instructions

1. This paper consists of **ten (10)** 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) List five personal protective equipment (PPE) items essential for a technician in an automotive workshop and explain their use.

   (b) Explain three reasons why maintaining cleanliness in the workshop is important for safety and efficiency.

   (c) Describe the steps to take when a technician suffers a minor electrical shock in the workshop.

2. (a) Explain the sequence of operation in a four-stroke diesel engine.

   (b) List four advantages of diesel engines over petrol engines.

   (c) Mention three disadvantages of diesel engines in passenger vehicles.

3. (a) State and explain the function of the following engine parts:

   (i) Rocker arm

   (ii) Connecting rod

   (iii) Piston ring

   (b) What is the importance of cylinder honing during engine overhaul?

   (c) List three symptoms of a blown head gasket.

4. (a) Define volumetric efficiency and explain its relevance in engine performance.

   (b) A four-cylinder engine has a bore of 90 mm and a stroke of 95 mm. Calculate its engine capacity in cubic centimeters (cc).

   (c) List four factors that influence engine compression ratio.

5. (a) Describe the layout and function of a disc brake assembly.

   (b) Differentiate between single circuit and dual circuit braking systems.

   (c) Explain the role of the brake booster in a hydraulic braking system.

6. (a) What is wheel alignment and why is it important?

   (b) Describe the symptoms and causes of poor wheel alignment.

   (c) Explain the procedure for checking toe-in on a vehicle.

7. (a) State four causes of vibration in a vehicle during motion.

   (b) Explain how to diagnose and correct a vehicle pulling to one side while driving.

   (c) What is dynamic balancing, and why is it necessary for wheels?

8. (a) Differentiate between series and parallel electrical circuits in automotive systems.

   (b) Explain the function of a relay in a vehicle electrical system.

   (c) Describe how to perform a continuity test on a fuse using a multimeter.

9. (a) Explain how the ECU adjusts engine operation based on input from the oxygen sensor.

   (b) What is the purpose of a throttle position sensor (TPS), and what happens if it fails?

   (c) List three types of sensors commonly used in fuel injection systems and their roles.

10. (a) Outline the process of flushing and refilling the engine cooling system.

    (b) Explain the function of a water pump in a cooling system.

    (c) State four causes of coolant loss in a sealed cooling system.