THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN TECHNICAL EDUCATION EXAMINATION

790 **AUTOMOBILE TECHNOLOGY**

Time: 3 Hour. **Year: 2006 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) State five general safety precautions to be followed before servicing a vehicle engine.

   (b) (i) What is the role of hazard signs in an automotive workshop?

   (ii) Describe three types of hazard signs and give one example for each.

   (c) Explain how to safely lift and support a vehicle for underbody repairs.

2. (a) Differentiate between spark ignition and compression ignition engines.

   (b) List and explain four effects of poor ignition timing in petrol engines.

   (c) (i) Define the term “scavenging” in two-stroke engines.

   (ii) Describe how scavenging efficiency affects engine performance.

3. (a) State the function of the following parts of an engine lubrication system:

   (i) Oil pump

   (ii) Pressure relief valve

   (iii) Oil strainer

   (b) Describe how oil circulates in a full-pressure lubrication system.

   (c) Mention three effects of using incorrect engine oil viscosity in modern engines.

4. (a) (i) What is gear ratio?

   (ii) How does gear ratio affect vehicle acceleration and fuel consumption?

   (b) Describe the function of a constant velocity (CV) joint in a front-wheel-drive vehicle.

   (c) State three symptoms of a worn-out CV joint.

5. (a) Explain how the parking brake (hand brake) mechanism operates in a drum brake system.

   (b) (i) What is brake fade?

   (ii) List two causes and two effects of brake fade.

   (c) Compare ventilated disc brakes and solid disc brakes in terms of construction and performance.

6. (a) Describe three differences between rack-and-pinion and recirculating ball steering mechanisms.

   (b) Explain the purpose and operation of a steering damper.

   (c) (i) What is the Ackermann steering principle?

   (ii) State its importance in vehicle turning.

7. (a) List four factors that affect tire wear.

   (b) Explain the importance of maintaining correct tire inflation pressure.

   (c) (i) Define wheel run-out.

      (ii) State two causes and two effects of excessive run-out.

8. (a) Outline the steps to test a vehicle battery using a hydrometer.

   (b) (i) What is a fusible link in vehicle electrical systems?

      (ii) State two advantages of using fusible links over regular fuses.

   (c) Describe the operation of an alternator voltage regulator.