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| UNIT REF:  AE06K | WRITTEN ASSESSMENTS  DIAGNOSIS AND RECTIFICATION OF AUTOMOTIVE AUXILIARY ELECTRICAL FAULTS |

Pass Mark 60%

This assignment is allocated **100** marks (**50** marks awarded for each of the **two** selected systems). Because of the nature of the unit, acceptable answers may vary considerably. It is expected that the assessor will allocate marks accordingly.

This assignment is designed to show an understanding of diagnosis and rectification of vehicle auxiliary electrical systems and their units. It also covers the evaluation of performance of the systems.

**Assignment:**

Select a vehicle from your normal place of work (e.g. college, training centre, or garage workshop).

Select **one** system from section **A** and **one** system from section **B**:

1. Electric Window **B.** Heater, Cooling and Air Conditioning

Electric Mirror Integrated Security/Warning

Wiper and Washer Lighting

Central Locking Supplementary Restraint and Airbag

For **each** of the **two** selected systems:

1. Provide a detailed description of the construction and operation. 10 marks AC (1.1, 1.2, 1.3, 2.2)

Analyse two different typical electrical faults - **one** for each of the systems chosen. Explain the symptoms and causes of the faults.(10 marks) AC (1.1, 1.2, 1.3, 2.2)

1. Explain the **systematic** diagnostic techniques used to identify the faults. Include the complete process; from initial inspection through to confirmation of the faults.(10 marks) AC (3.1, 3.3)
2. Explain the type of diagnostic measurements and readings expected to be found during the process, and how these readings would compare to the manufacturer’s specifications.

(10 marks) AC ( 3.6)

1. Explain the rectification process to correct the faults; include the selection and preparation of any equipment used, the correction procedure (unit replacement or adjustment) and the evaluation of the repaired system to confirm performance. (10 marks) AC (3.4, 3.6, 3.7)

**Assignment guidance:**

The assignment should:

* be all your own work and contain approximately 600-900 words for each of the two systems
* show in-depth knowledge of each system and a clear understanding of the diagnostic processes and rectification activities

**The assignment should include:**

* at least one labeled diagram for each system
* at least one circuit diagram for each system
* supporting technical data
* vehicle details (make, model, VIN)

**When completing this summative assignment you should refer to the following assessment criteria for the unit AE06k:**

**1.1** Explain the principles of electrical inputs, outputs. voltages and oscilloscope patterns, digital and fibre optics

**1.2** Explain the principles of sensor inputs, computer processing and actuator outputs

**1.3** Identify sensor types (passive and active)

**1.4** Identify the electrical principles that are related to light vehicle electrical circuits

**2.1** Identify advanced automotive auxiliary electrical system components

**2.2** Explain the construction and operation of automotive auxiliary electrical systems

**2.3** Explain the interaction between electrical, electronic and mechanical components within the system defined

**2.4** Explain the operation of the electrical and electronic systems for electric, hybrid and alternative fuel vehicles including regenerative braking systems

**2.5** Explain how electrical systems interlink and interact, including multiplexing and fibre optics

**2.6** Compare automotive auxiliary electrical system components and assemblies against alternatives to identify differences in construction and operation

**3.1** Explain the symptoms and causes of faults found in automotive auxiliary electrical systems

**3.2** Explain systematic diagnostic techniques used in identifying automotive auxiliary electrical system fault

**3.3** Explain how to examine, measure and make suitable adjustments to components

**3.4** Explain how to carry out the rectification activities in order to correct the faults in the automotive auxiliary electrical systems

**3.5** Explain how to select, prepare and use diagnostic and rectification equipment for automotive auxiliary electrical systems

**3.6** Explain how to evaluate and interpret test results found in diagnosing automotive auxiliary electrical system faults against vehicle manufacturer specifications and settings

**3.7** Explain how to evaluate the operation of components and systems following diagnosis and repair to confirm system performance