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| UNIT REF: L1AM03 | | LEARNER SUPPORT MATERIAL TASK SHEET  **UNIT TITLE: SPARK IGNITION ENGINE SYSTEMS COMPONENTS AND OPERATION** | | | | |
| **Learner Name:** | | | | **Date of Task:** | | |
| **KNOWLEDGE QUESTIONS** | | | | | | | |
| **Question Number** | **Question** | | | | **AC** | **Marks Awarded** | |
| 1. | Identify and State the purpose of the following main components used in petrol Spark Ignition **(SI)** engines: **(32 marks)** | | | | AC1.1-1.2 |  | |
| A. | http://www.vtrustcorporation.com/wordpress/wp-content/gallery/cylinder-head/2013-6-2l-ls3-c-cylinder-head-2.jpg | | Identify Part: | | | | |
| State purpose: | | | | |
| B. | http://www.enginebasics.com/Engine%20Basics%20Root%20Folder/Images/camshaft.jpg | | Identify Part: | | | | |
| State purpose: | | | | |
| C. | http://media.appliednanosurfaces.com/2013/04/crankshaft.png | | Identify Part: | | | | |
| State purpose: | | | | |
| D. | http://www.superformance.co.uk/parts/0586f_fiat_246_308_2v_valves.jpg | | Identify Part: | | | | |
| State purpose: | | | | |

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| E. | [http://www.venolia.com/gallery/d/194-2/ferrari-v12-piston.jpg](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwiY1Py2m6bJAhUBMhQKHaFMBQYQjRwIBw&url=http://www.venolia.com/gallery/images/products/pistons/import/ferrari-v12-piston.jpg.html&bvm=bv.108194040,d.d24&psig=AFQjCNHDAvP7-oOEZNAvhlrfj3_Ri18WGQ&ust=1448356673901903) | Identify Part: | | |
| State purpose: | | |
| F. | [http://www.regalautosport.com/shop/image/data/corsa_d/Piston_Ring.jpg](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwi5vJLNm6bJAhXDtRQKHdblDioQjRwIBw&url=http://www.regalautosport.com/shop/Piston_Rings_to_suit_RSS_Forged_High_Compression_Piston_for_Corsa_D_VXR.html&bvm=bv.108194040,d.d24&psig=AFQjCNEMaHPvTa9qYlrfgeGIZqld3pvPkA&ust=1448356776953636) | Identify Part: | | |
| State purpose: | | |
| G. | [http://www.govindcrankrod.com/pro_img/rod/1.jpg](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwigzevmm6bJAhWDuhQKHYvqAewQjRwIBw&url=http://www.govindcrankrod.com/conn_rod.php&bvm=bv.108194040,d.d24&psig=AFQjCNHUuEQiEwbqP4ujAbrF_xpjFVFwKA&ust=1448356830978019) | Identify Part: | | |
| State purpose: | | |
| H. | [http://www.jbugs.com/store/graphics/00000001/vw_valve_spring_intake_113109623c.jpg](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjC-NuanKbJAhWDPxQKHS4FDncQjRwIBw&url=http://www.jbugs.com/product/113109641B.html&bvm=bv.108194040,d.d24&psig=AFQjCNEvaIdnNXDRE0NWRhnwvqmGtpvKwg&ust=1448356895323229) | Identify Part: | | |
| State purpose: | | |
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| 2. | Outline the main purpose for each of the following systems **(8 marks)** | | AC1.3 |  |
| A. | Cooling System – | | | |
| B. | Lubrication System – | | | |
| C. | Fuel System – | | | |

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| D. | Ignition System – | | | |
| **Question Number** | **Question** | **AC** | | **Marks Awarded** |
| 3. | State the operating cycle of the 2 stroke petrol engine: **(4 marks)** | AC2.1 | |  |
| 1. |  | | | |
| 2. |  | | | |
|  | | | | |
| 4. | State the operating cycle of the 4 – stroke petrol engine: **(8 marks)** | AC2.1 | |  |
| 1. | Stroke: | | | |
| 2. | Stroke: | | | |
| 3. | Stroke: | | | |
| 4. | Stroke: | | | |
|  | | | | |
| 5. | Draw a circular diagram of the 4 stroke cycle indicating:   * Inlet valve opening and closing * Exhaust valve opening and closing * Top and bottom dead centres * Typical ignition point * Direction of rotation **(16 marks)** | | AC2.2 |  |
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| **Question Number** | **Question** | | **AC** | **Marks Awarded** |
| 6. | Give examples of the correct type air / fuel ratios for each of the following:  **(6 marks)** | | AC2.3 |  |
| A. | Rich Mixture – | | | |
| B. | Weak Mixture – | | | |
| C. | Ideal Mixture– | | | |
|  | | | | |
| 7. | Identify the four main constituents of SI exhaust gas emissions and their effects on the environment: **(16 marks)** | | AC2.4 |  |
| Gas A: | | Effects on health and the environment: | | |
| Gas B: | | Effects on health and the environment: | | |
| Gas C: | | Effects on health and the environment: | | |
| Gas D: | | Effects on health and the environment: | | |