<table>
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<th>Q</th>
<th>Acceptable answer(s)</th>
<th>Guidance</th>
<th>Max mks</th>
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| 1 | • Drum  
    • Dry disc  
    • Wet disc  
    • Caliper disc. | 1 mark for each, max of 3 marks | 3 |
| 2 | Brake pedal or lever operated fluid (1) pushes piston in caliper out (1) and compresses brake pads against disc (1) and slows drive shaft. (1) | 4 marks for explanation, accept any other suitable answer | 4 |
| 3 | Description to include  
    • flat level ground  
    • correct tyre pressures  
    • measure distance with tracking tool or tape measure inside rims edges at the front and rear deduct reading to get tracking.  
    • 4WD vehicle shown will toe-out typical reading 0-3 mm  
    • adjust each steering rod end the same amount  
    • Roll vehicle forward and recheck  
    • ensure all fittings are torqued at end of procedure. | Accept any other suitable answer | 5 |
| 4 | • Fire  
    • Burning  
    • Electric shock  
    • Damage to components  
    • Fumes  
    • Short circuit  
    • Earth  
    • Accept any other suitable answer | 1 mark each, up to 3 marks | 3 |
5  | i) wire or component broken or disconnected (1) current will not flow (1)  
   | ii) wire grounded or wires touching (1) usually results in blown fuse (1)  
   | iii) Loose, dirt or faulty connection or faulty components (1) usually cause heat. (1)  
   | 2 marks per explanation, up to 6 marks  
   | Accept any other suitable answer

6  | Amps = watts/volts  
   | 60w divided by 12V = 5 amps  
   | 1 mark for correct formula  
   | 1 mark for substitution  
   | 1 mark for correct answer

7  | a) GPS–accurate positioning system via orbiting satellites  
   | b) CANBUS – allow controllers to communicate with each other.  
   | c) ISOBUS – Serial control and communications data network  
   | 1 mark for each correct answer  
   | Accept any other suitable answer

8  | a) A resistor is an electronic component that restricts the flow of current (1) passing through it, most do it by separating the wire with a semiconductor (1) that has fewer free electrons (1)  
   | b) Zener diodes (are a single component that works like a normal diode) but it also allows current to flow in the opposite direction (1) when a required breakdown voltage is reached (1) to give a steady voltage output. (1)  
   | 3 mark each, up to 6 marks  
   | Accept any other suitable answer

9  | Wave 1- straight line linear voltage relates to pressure (bar)  
   | Wave 2- Multiple wave form with missing segment at regular intervals  
   | Wave 3- Voltage drops over time  
   | 1 mark for each  
   | Accept any other suitable answer

10 | a) Micron- size of particles (usually) a filter will remove 1000 µM  
    | b) Cavitation- Air of vapour in the hydraulic oil causing erratic system operation, damage and noise.  
    | 1 mark each answer  
    | Accept any other suitable answer
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<th>c) Cracking pressure - The pressure at which a hydraulic valve begins to open.</th>
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<td><strong>11</strong></td>
<td>The variable displacement pump 4 sends pressurised oil via the inlet priority valve (1) to the rocker shaft valve 6 (1), which controls the oil feed to the lift cylinders which is determined by the stepper motor 5 (1). If the operator moves a control on the cab panel 1, (1) this signal is then sent to the hitch control unit electronic box 2 (1), it then monitors the position of the rocker shaft by position sensor 3 / draft forces by lower link pins 7 (1) and reacts to the signal by opening or closing the raise and lower valve 6 (1) by means of the stepper motor 5 (1).</td>
<td>(1 mark for each point up to 6 marks) Alternative terminology may be used. Accept any other correct responses. 6</td>
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<td><strong>12</strong></td>
<td>3000/14.5 = 206.84 bar (accept a range between 200 – 207 bar)</td>
<td>1 mark for conversion 1bar – 14.5psi 1 mark for substitution 1 mark for the correct answer 3</td>
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<td><strong>13</strong></td>
<td>Band 1 (1-4 marks) Basic fault procedures listed with some understanding of component layout and operation. Little or no specialist terms used. Band 2 (5-8 marks) Some fault finding procedures listed in a logical sequence reasonable understanding of component layout and operation. Some specialist terms used. The information is mostly presented in a structured format. Band 3 (9-12 marks) Clear understanding of fault finding procedures and clear appreciation of component layout, and operation. Specialist terms will be used correctly and appropriately. Diagnostics presented in a structured format.</td>
<td>Indicative content Visual - System leaks from master and slave cylinders, pipes and hoses trailer brake valve. Inspect- fluid level, condition and correct type. Operate the brakes – to check noise Bleed system – correct procedures explained to remove air Conclusions- internal leakage brake discs. For no awardable content, award 0 marks. 12</td>
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