|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q | Scheme | Marks | AOs | Pearson Progression Step and Progress descriptor |
| 1a | = | M1 | 1.1b | 2nd  Calculate probabilities from relative frequency tables and real data. |
| = 0.4 | A1 | 1.1b |
|  | (2) |  |  |
| 1b | = | M1 | 3.1a | 4th  Understand set notation. |
| = 0.864 | A1 | 1.1b |
|  | (2) |  |  |
| 1c | P(*S**A*) == 0.136 ≠ P(*S*) × P(*A*) ==0.163… | **M1** | 2.1 | 4th  Understand and use the definition of independence in probability calculations. |
| So, *S* and *A* are not statistically independent. | **A1** | 2.4 |
|  | **(2)** |  |  |
| 1d | *B* and *C* are not mutally exclusive | B1 | 2.2a | 3rd  Understand and use the definition of mutually exclusive in probability calculations. |
| Being in team *C* does not exclude the possibility of winning a bronze medal | B1 | 2.4 |
|  | (2) |  |  |
| 1e | = | M1 | 3.1b | 5th  Calculate conditional probabilities using formulae. |
| = 0.424 | A1 | 1.1b |
|  | (2) |  |  |
| (10 marks) | | | | |
| Notes | | | | |

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| Q | Scheme | Marks | AOs | Pearson Progression Step and Progress descriptor |
| **2a** | **\\192.168.0.251\Pearson\A Level Maths\WIP files\Unit tests\Stats 2\Artwork\2. Files from YPS\alevel_ut_s2_u2_markscheme_aw1.png**  Let *N*~ new tyre and *T*~ tracking  P(*N*) = 0.33 and P(*T*) = 0.67  0.7, 0.3, 0.04 and 0.96 | **B1**  **B1**  **B1** | 2.5  1.1b  1.1b | 3rd  Draw and use tree diagrams with three branches and/or three levels. |
|  | **(3)** |  |  |
| **2b** | P(exactly one defect) = 0.33 × 0.3 + 0.67 × 0.04 | **M1** | 3.1b | 5th  Understand the language and notation of conditional probability. |
| = 0.1258 | **A1** | 1.1b |
|  | **(2)** |  |  |
| **2c** | 1 − P(no defects) =1− 0.67 × 0.96 × 0.65 | **M1** | 3.1b | 5th  Understand the language and notation of conditional probability. |
| = 0.5819… awrt 0.582 (3 d.p.) | **A1** | 1.1b |
|  | **(2)** |  |  |
| **2d** | To have their cars checked regularly as there is over a 50 % chance they need new tyres, tracking or brake pads. | **B1** | 3.2a | 5th  Understand the language and notation of conditional probability. |
|  | **(1)** |  |  |
| (8 marks) | | | | |
| Notes | | | | |

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| Q | Scheme | Marks | AOs | Pearson Progression Step and Progress descriptor |
| **3a** | P(*E*'|*F*') = or | **M1** | 3.1a | 4th  Calculate probabilities using set notation. |
| =or 0.783 (3 s.f.) | **A1** | 1.1b |
|  | **(2)** |  |  |
| **3b** | P(*E*) × P(*F*) = 0.25 × 0.4 = 0.1 ≠ P(*E**F*) = 0.12 | **M1** | 2.1 | 4th  Understand and use the definition of independence in probability calculations. |
| So, *E* and *F* are not statistically independent. | **A1** | 2.4 |
|  | **(2)** |  |  |
| **3c** | **\\192.168.0.251\Pearson\A Level Maths\WIP files\Unit tests\Stats 2\Artwork\2. Files from YPS\alevel_ut_s2_u2_markscheme_aw2.png**  Use of independence and all values in *G* correct.  All values correct. | **B1**  **M1A1**  **M1A1** | 2.5  3.1a  1.1b  1.1b  1.1b | 3rd  Understand and use Venn diagrams for multiple events. |
|  | **(5)** |  |  |
| **3d** | P([*F**G*]') = 0.13 + 0.38 | **M1** | 3.1a | 4th  Calculate probabilities using set notation. |
| = 0.51 | **A1** | 1.1b |
|  | **(2)** |  |  |
| (11 marks) | | | | |
| Notes | | | | |

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| Q | Scheme | Marks | AOs | Pearson Progression Step and Progress descriptor |
| **4a** | **\\192.168.0.251\Pearson\A Level Maths\WIP files\Unit tests\Stats 2\Artwork\2. Files from YPS\alevel_ut_s2_u2_markscheme_aw3.png**  Let *F* ~ faulty | **B1**  **B1**  **B1** | 2.5  1.1b  1.1b | 3rd  Draw and use tree diagrams with three branches and/or three levels. |
|  | **(3)** |  |  |
| **4b** | P(*B**F*') = 0.35 × 0.98 | **M1** | 1.1b | 5th  Understand and calculate conditional probabilities in the context of tree diagrams. |
| = 0.343 | **A1** | 1.1b |
|  | **(2)** |  |  |
| **4c** | P(*F*) = 0.4 × 0.05 + 0.35 × 0.02 + 0.25 × 0.03 | **M1** | 1.1b | 5th  Understand and calculate conditional probabilities in the context of tree diagrams. |
| = 0.0345 | **A1** | 1.1b |
|  | **(2)** |  |  |
| **4d** | P(*C*'|*F*) === | **M1**  **A1ft** | 3.1b  1.2 | 5th  Calculate conditional probabilities using formulae. |
| 0.7826... or (accept awrt 0.783) | **A1** | 1.1b |
|  | **(3)** |  |  |
| (10 marks) | | | | |
| Notes | | | | |

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| Q | Scheme | Marks | AOs | Pearson Progression Step and Progress descriptor |
| 5a | \\192.168.0.251\Pearson\A Level Maths\WIP files\Unit tests\Stats 2\Artwork\2. Files from YPS\alevel_ut_s2_u2_markscheme_aw4.png  *T* = hand assignments in on time, *D* = start assignments on the day they are issued | **B1**  **B1**  **B1** | 2.5  1.1b  1.1b | 2nd  Draw and use simple tree diagrams with two branches and two levels. |
|  | (3) |  |  |
| **5bi** | P(*T**D*) = P(*T*|*D*) × P(*D*) | **M1** | 3.1b | 5th  Understand and calculate conditional probabilities in the context of tree diagrams. |
| =  =or 0.33 | **A1** | 1.1b |
|  | **(2)** |  |  |
| **5bii** |  | **M1** | 3.1b | 5th  Understand and calculate conditional probabilities in the context of tree diagrams. |
|  | or 0.841… | **A1** | 1.1b |  |
|  | P(*T*''*D*') = | **M1** | 1.1b |  |
|  | or 0.0633… (accept awrt 0.0633) | **A1** | 1.1b |  |
|  |  | **(4)** |  |  |
| **5c** | P(*T**D*) =≠ P(*T*) × P(*D*) = | **M1** | 2.1 | 4th  Understand and use the definition of independence in probability calculations. |
| So, *T* and *D* are not statistically independent. | **A1** | 2.4 |
|  | **(2)** |  |  |
| (11 marks) | | | | |
| Notes  **5bii** Alternative solution  P(*T*''*D*') = 1 − P(*T**D*)  P(*T**D*) =  =  P(*T*''*D*') = 1 −= | | | | |