| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** | Resolving horizontally: | M1A1 |
| (N) | A1 |
|  |  | **(3)** |
| **1(b)** | Resolving vertically: | M1A1 |
| = | A1 |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **2(a)** | Resolving horizontally: | M1A1 |
| (N), 4.5 (N), or better | A1 |
|  |  | **(3)** |
| **2(b)** | Resolving vertically: | M1A1 |
| = 6.82 (N), 6.8 (N), or better | A1 |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **3** |  |  |
| Resolve horizontally: | M1A1 |
| Resolve vertically: | M1A1 |
| Equation in one unknown: | **DM1**A1 |
| or |  |
| TA = 8.4, 8.37, 8.372 (N) or better | A1 |
| TB = 7.6, 7.57, 7.567 (N) or better | A1 |
|  |  | **(8 marks)** |
| **4(a)** |  |  |
|  | M1 A1 |
| Leading to | A1 |
|  |  | **(3)** |
| **4(b)** |  | M1 A2 **ft** (1,0) |
|  | A1 |
|  |  | **(4)** |
|  |  | **(7 marks)** |
| **5** |  | M1 A1 |
|  | M1 A1 |
|  | B1 |
| eliminating *F* and *R* | **DM**1 |
| , 1.6g (or better), 15.5, 15 (N) | **DM**1 A1 |
|  |  | **(8)** |
| **6(a)** |  |  |
| plane | M1 A2(1,0) |
| or 52 | A1 |
|  |  | **(4)** |
| **6(b)** |  | B1 |
| plane | M1 A2(1, 0) |
| Leading to or 0.14 | A1 |
|  |  | **(5)** |
|  |  | **(9 marks)** |
| **7** |  |  |
|  | M1 A1 |
|  | M1 A1 |
|  | B1 |
|  | B1 |
| GIVEN ANSWER | M1 A1 |
|  | A1 |
| **OR** |  |
|  | M1 A1 |
|  | M1 A1 |
|  | B1 |
|  | B1 |
| GIVEN ANSWER | M1 A1 |
|  | A1 |
|  |  | **(9 marks)** |
| **8(a)** | 7 + 5 + *p* = 0 or – 9 + 6 + *q* = 0 | M1 |
| *p* = –12 | A1 |
| *q* = 3 | A1 |
|  |  | **(3)** |
| **8(b)** |  |  |
| or 3√17 or 12.4 or better | M1 A1 |
|  |  | **(2)** |
| **8(c)** |  | M1 |
|  | A1 |
| Angle with is , to the nearest degree cao | A1 |
|  |  | **(3)** |
|  |  | **(8 marks)** |
| **9** |  | B1  M1 A2  M1 A2  M1 A1 |
|  |  | **(9 marks)** |
| **10** |  | B1  M1 A2  M1 A2  M1 M1  A1 |
|  |  | **(10 marks)** |
| **11(a)** |  |  |
| Resolving perpendicular to the plane: |  |
|  | M1 A1 A1 |
| = 114 \* | A1 |
|  |  | **(4)** |
| **11(b)** |  |  |
|  | M1 A1 |
|  | A1 |
|  | M1 |
| Resolving parallel to the plane: |  |
| In equilibrium: | M1 A(2,1,0) |
| = | A1 |
|  |  | **(8)** |
| **11(c)** | **OR** | M1 A1 |
| So  acting up the plane. | A1 |
|  |  | **(3)** |
|  |  | **(15 marks)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | M1 2014R | 1 |  | Statics of a particle | 1.1b, 3.1b |
| 2 | M1 2014 | 1 |  | Statics of a particle | 1.1b, 3.1b |
| 3 | M1 2013R | 2 |  | Statics of a particle | 1.1b, 3.1b |
| 4 | M1 2012 | 2 |  | Statics of a particle, Moments | 1.1b, 2.2a, 3.1b |
| 5 | M1 2013 | 3 |  | Statics of a particle | 1.1b, 1.2, 3.1b, 3.4 |
| 6 | M1 2012 | 3 |  | Statics of a particle | 1.1b, 1.2, 3.1b |
| 7 | M1 2011 | 3 |  | Statics of a particle | 1.1b, 1.2, 3.1b |
| 8 | M1 Jan 2012 | 3 |  | Statics of a particle | 1.1a, 1.1b, 3.1b |
| 9 | M1 2017 | 4 |  | Statics of a particle | 1.1b, 1.2, 2.2a, 3.1b |
| 10 | M1 2016 | 5 |  | Statics of a particle | 1.1b, 1.2, 2.2a, 3.1b |
| 11 | M1 Jan 2011 | 6 |  | Statics of a particle | 1.1b, 1.2, 2.2a, 3.1b |