| **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** |  | B1M1 A2M1 A2M1 A1 |
|  |  | **(9 marks)** |
| **10** |     | B1M1 A2M1 A2M1 M1A1 |
|  |  | **(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 |