| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** |  | M1 |
|  | A1 |
|  |  | **(2)** |
| **1(b)** | or or or | M1 |
| **WAY1**or **WAY 2** | A1 |
|  or  | M1 |
| Total **(WAY 1)**orTotal **(WAY 2)** | **dd**M1 |
| 10316 | A1 |
|  |  | **(5)** |
|  |  | **(7 marks)** |
| **2(a)** | Boy’s Sequence:  |  |
|  or  | M1 A1 |
|  |  | **(2)** |
| **2(b)** |  | M1 A1 |
|  | A1 |
|  |  | **(3)** |
| **2(c)** | Boy’s Sister’s Sequence:  |  |
|  | M1 A1 |
|  | dM1 |
|  or  |  |
|  |  |
|  **(\*)** | A1 **cso** |
|  |  | **(3)** |
| **2(d)** |  | B1 |
|  |  | **(1)** |
|  |  | **(10 marks)** |
| **3(a)** |  or  | M1 |
| 162 = 10*a* + 45*d* **\*** | A1cso |
|  |  | **(2)** |
| **3(b)** |  | B1 |
|  |  | **(1)** |
| **3(b)** |  | M1 |
| (a) is 10*a* + 45*d* = 162 |  |
| Subtract 5*d* = 8 so *d* = 1.6 o.e. | A1 |
| Solving for *a* *a* = 17 - 5*d* | M1 |
|  so *a* = 9 | A1 |
|  |  | **(4)** |
|  |  | **(7 marks)** |
| **4(a)** | 600 = 200 + (*N* – 1)20  | M1 |
| *N* = 21 | A1 cso |
|  |  | **(2)** |
| **4(b)** |  or (= 8400 or 7800) | M1A1 |
| (= 18600) | M1A1ft |
| So total is 27000 | A1 cao |
|  |  | **(5)** |
|  |  | **(7 marks)** |
| **5(a)** |  Lewis; arithmetic series,   |  |  |
|   | Or lists 20 terms to get to 520 | M1 A1 |
| OR 120 + (20)(20) |  |  |
|  |  | **(2)** |
| **5(b)** | Method 1 | Method 2 |  |
| **Either:** Uses  | **Or:** Uses   | M1 |
|   |   ft 520 | A1 |
|  6600 | A1 |
|  |  | **(3)** |
| **5(c)** | Sian; arithmetic series,  |  |  |
| **Either:** Attempt to use  | **Or:** May use both   and  **and eliminate** *d* | M1 |
|   |   | A1 |
|  | A1 |
|  |  | **(3)** |
|  |  | **(8 marks)** |
| **6(a)** | (a) Use  with *d* = 10; *a* = 150 and *n* = 8, or *a* = 160 and *n* = 7, or *a* = 170 and *n* = 6 : = 150+7×10 or 160 +6 ×10 or 170 + 5 ×10  | M1 |
|  = 220\* (Or gives clear list – see note) | A1\* |
|  |  |  **(2)** |
| Or | If answer 220 is assumed and 150 + (*n* – 1) 10 =220 or variation is solved for *n=* | M1 |
| Then *n* = 8, so 2007 is the year (must conclude the year) | A1\* |
|  |  | **(2)** |
| **6(b)** | Use  or  **and** *l= a + (n –* 1)10 | M1 |
|  = 7(300 + 13 × 10) or 7(150 + 280) | A1 |
|  = 7×430 |  |
|  = 3010  | A1 |
|  |   | **(3)** |
| **6(c)** |  Cost in year *n* = 900 + (*n* – 1) × –20 | M1 |
|  Sales in year *n* = 150 + (*n* – 1) × 10 |  |
|  |  |
|  Cost = 3 × Sales ⇒ 900 + (*n* – 1) × –20 = 3 × (150 + (*n* – 1) × 10) | M1 |
|  900 – 20*n* + 20 = 450 + 30*n* – 30 |  |
|  500 = 50*n*  |  |
|  *n* =10  | M1 |
|  Year is 2009 | A1 |
| As *n* is not defined they may work correctly from another base year to get the answer 2009 and their *n* may not equal 10. If doubtful – send to review. |  |
|  |  | **(4)** |
|  |  | **(9 marks)** |
| **7(a)** |  | M1 |
| (*k* =) 11 | A1 |
|  |  | **(2)** |
| **7(b)** |  | M1 |
| (= 269 500 or 237 500) | A1 |
|  | M1 |
| 288 000 + 269 500 = 557 500or320 000 + 237 500 = 557 500 | ddM1A1 |
|  |  | **(5)** |
|  |  | **(7 marks)** |
| **8(a)** |  or   | M1 |
|  e.g. = (£) (10*P* + 90*T*) or (£) 10*P* + 90*T* **(\*)** | A1cso |
|  |  | **(2)** |
| **8(b)** | Scheme 2:  | M1A1 |
| 10*P* + 90*T* = 10*P* + 18000 + 45*T* | M1 |
|  90*T* = 18000 + 45*T* |  |
|  *T =* 400 (only) | A1 |
|  |  | **(4)** |
| **8(c)** | Scheme 2, Year 10 salary:  | B1ft |
| *P* + 1800 + “3600” = 29850 | M1 |
|  *P* = (£) 24450 | A1 |
|  |  | **(3)** |
|  |  | **(9 marks)** |
| **9(a)** | Series has 50 terms | B1 |
|  or  | M1 A1 |
|  |  | **(3)** |
| **9(b)** |  | B1 |
| Sum:  or  | M1 A1 |
|   (\*) | A1 cso |
|  |  | **(4)** |
| **9(c)** | 50th term =  |  |
|    | Or 2*k* + 49(2*k*) + 1 + 49(3) | M1 |
|   |   | A1 |
|  |  | **(2)** |
|  |  | **(9 marks)** |
| **10(a)** |  Attempts to use  with *a=A* and “*d”=d*+1 and *n* = 14  | M1 |
|  \* | A1\* |
|  |  | **(2)** |
| **10(b)** |  Calculates time for Yi on Day 14= | M1 |
|  Sets **times** equal =   | M1 |
|  |   *d* = 3 | A1 cso |
|  |  | **(3)** |
| **10(c)** |  Uses with *n* =14, and with *D*=*d* or *d* + 1  | M1 |
|  Attempts to solve   | dM1 |
|   | A1 |
|  |  | **(3)** |
|  |  | **(8 marks)** |

|  |  |  |  |  |  |
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|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | C1 2017 | 4 | 4.4 and 4.6 | Arithmetic sequence | 3.1b and 3.4 |
| 2 | C1 2012 | 6 | 4.4 and 4.6 | Arithmetic sequences and series | 1.1b, 2.1, 2.4, 3.1b and 3.4 |
| 3 | C1 Jan 2011 | 6 | 4.4 | Arithmetic sequences and series | 1.1b, 3.1a |
| 4 | C1 2013 | 7 | 4.4 | Arithmetic Series | 1.1b, 2.1, 2.2a, 3.1b, 3.2, 3.3, 3.4 |
| 5 | C1 Jan 2013 | 7 | 4.4 and 4.6 | Arithmetic sequences and series | 1.1b, 3.1b, 3.2, 3.4 |
| 6 | C1 2014 | 8 | 4.4 | Arithmetic sequences | 1.1b, 2.1, 2.2a, 3.1b, 3.2, 3.4 |
| 7 | C1 2015 | 9 | 4.4 and 4.6 | Real-life use of sequences  | 1.1b, 3.4 |
| 8 | C1 Jan 2012 | 9 | 4.4 and 4.6 | Arithmetic sequences and series | 1.1b, 2.1, 2.2a, 3.1b |
| 9 | C1 2011 | 9 | 4.4 | Arithmetic sequences and series | 1.1b, 2.1 and 2.4 |
| 10 | C1 June 2014R | 10 | 4.4, 4.6 | Use of arithmetic sequence | 1.1b, 2.4, 3.1b, 3.4 |