| **Question** | **Scheme** | | **Marks** |
| --- | --- | --- | --- |
| **1(a)** |  | | M1 |
|  | | A1 |
|  |  | | **(2)** |
| **1(b)** | or  or  or | | M1 |
| **WAY1**  or  **WAY 2** | | A1 |
| or | | M1 |
| Total  **(WAY 1)**  or  Total  **(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 = 557 500  or  320 000 + 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 |