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| *Mathematics in Context – Winter Olympics* | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 1 | (a)(i) |  | =sum(E2:E27) | 2 | B1 |
|  | (ii) |  | =(F2-G2)^2  or (G2-F2)^2 |  | B1 oe |
|  | (b)(i) | Relevant data   |  |  |  | | --- | --- | --- | |  | 2010 | 2014 | | Min | 1 | 1 | | Q1 | 3 | 4 | | Q2 | 6 | 8 | | Q3 | 14 | 17 | | Max | 30 | 33 | | Out | 37 |  | | Correct box plots  (see end of mark scheme) | 6 | M1 at least 3 correct values, correctly identified for either 2010 or 2014  A1 correct 5 values for 2010 or 2014 M1 for identification of USA as an outlier in 2010 M1 for a box and whisker diagram for 2010 or 2014  A1 for one correct diagram  A1 for both diagrams correct (including the outlier) with identification and labelling of the horizontal axis ft on their values |
|  | (b)(ii) |  | Relevant interpretations | 2 | B1 eg since the IQR and range are greater in 2014 than in 2010 there is a greater spread of medal winning.  B1 e.g since the median in 2014 is greater than in 2010 there were more medals won per country on average in 2014 |
|  | (c) | The minimum, Q1 and Q2 would all be 0. Q3 would be 2.5 or 3 and the maximum would still be 33.Many of the entries in the table would then be outliers | Relevant comments | 2 | B1 for The minimum, Q1 and Q2 would all be 0 B1 Q3 would be 2.5 or 3 and the maximum would still be 33 or Many of the entries in the table would then be outliers or equivalent |

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| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 2 | (a) |  | 0.370  0.535  0.595 | 4 | M1 for correct use of formula in at least 1 instance  M1 for completing values of d2 in table 2  A1 0.37(0)  A1 0.535...  A1 0.595.... |
|  | (b) |  | Two relevant comments | 2 | B1 first relevant comment e.g. all three values show a positive correlation, so there is a relationship between population and medal winning (for example)– bigger populations are associated with more medals  B1 second relevant comment e.g the largest correlation is between the standard of living measure and the number of medals won. |
| 3 | (a) | |  |  |  |  | | --- | --- | --- | --- | | **T oC** | **F** | **FT** | **FT^2** | | -14 | 1 | -14 | 196 | | -10 | 1 | -10 | 100 | | -8 | 1 | -8 | 64 | | -7 | 3 | -21 | 147 | | -6 | 4 | -24 | 144 | | -5 | 2 | -10 | 50 | | -4 | 0 | 0 | 0 | | -3 | 3 | -9 | 27 | | -2 | 2 | -4 | 8 | | -1 | 2 | -2 | 2 | | 1 | 1 | 1 | 1 | |  | 20 | -101 | 739 | | -5.05  3.38 | 4 | M1 for use of Σfx ÷ Σf  A1 -5.05  M1 for use of the SD formula  A1 3.38 – 3.4 |

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| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
|  | (b) |  | Two relevant comments | 2 | B1 first relevant comment e.g. the mean for night-time is about 8° lower than for daytime  B1 second relevant statement e.g. the SD for the night-time temperatures is greater than the SD for daytime temperatures meaning that there is smaller variation in daytime temperatures |
|  | (c) |  | 5.25 | 3 | M1 for  A1 5.25 ( accept 5)  B1 any relevant comment eg. weather patterns will be the same in 2018 as when the table 4 data was collected |
|  | (d) |  | Relevant interpretation in context | 1 | B1 e.g. High night-time temperatures are generally followed by high daytime temperatures |
|  | (e) |  | No effect | 1 | B1 No effect |
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