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| **MATHEMATICS DEPARTMENT** | |  |
| **Course:** **A2MAA** | |
| **Topic Title**: **Investigation 3 – Univariate data analysis** | |
| Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date: \_\_\_\_\_\_\_\_\_\_2016 | | |
| Special Instructions: Calculators allowed, No Notes allowed. | Time Allowed: 50 mins | | |
|  | Marks: / 29 | | |

**In-class investigation**

**Question 1**

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|  | Solution | Marking key/mathematical behaviours | Marks |
| (a) | To give the tests equal weighting | * Identifies equal weightings | 1 |
| (b) | 73.2% + 3.5% = 76.7% | * Determines addition to obtain 76.7% | 1 |
| (c) | 73.2% - 8.75% = 64.45% | * Determines 2.5 standard deviations from the mean * Subtracts result from mean for Test 5 | 1  1 |
| (d) | Yes. He did not deviate from the mean (0 deviations) and the mean was 73.2% | * States agreement * Identifies zero deviations | 1  1 |
| (e) | 72% - 65.4% = 6.6%  6.6% ÷ 8.2=0.8048  0.8048 x 3.5%=2.817%  73.2%+2.817%~76% | * Calculates difference in means * Determines number of deviations * Determines marks to be added | 1  1  1 |

**Question 2**

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|  | Solution | Marking key/mathematical behaviours | Marks |
| (a) | True. In both years the median is 40c per share | * Identifies truth of statement * Justifies conclusion | 1  1 |
| (b) | False. Q1 is less than 30c  Medina is less than $1 | * Identifies truth of statement * Justifies conclusion | 1 |
| (c) | False. The cut-off for 50% was 40c. Only half were 40c or above | * Identifies truth of statement * Justifies conclusion | 1  1 |
| (d) | True. The right whisker is further to the right. | * Identifies truth of statement * Justifies conclusion | 1  1 |
| (e) | False. At least 75% were over in 2013 but Q1 was under 20c in 2013. | * Identifies truth of statement * Justifies conclusion | 1  1 |

**Question 3**

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| (a) Solution   |  |  |  | | --- | --- | --- | | . Range of values | Probability of being in that range | Probability of being outside that range | | From 85 to 115 | 0.68268949 | 0.31731051 | | From 77.5 to 122.5 | 0.86638560 | 0.1336144 | | From 70 to 130 | 0.95449974 | 0.04550026 | | From 62.5 to 137.5 | 0.98758067 | 0.01241933 | | From 55 to 145 | 0.99730020 | 0.00269980 | | From 47.5 to 152.5 | 0.99953474 | 0.00046526 | | From 40 to 160 | 0.99993666 | 0.00006334 | | |
| Marking key/mathematical behaviours | Marks |
| * Subtracts given probability from 1 * Uses Normal distribution to calculate probability * Calculates complement * Subtracts given probability from 1 | 1  1  1  1 |

**Question 3 (cont’d)**

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|  | Solution | Marking key/mathematical behaviours | Marks |
| (b) | 68 | * Links population and probability to calculate | 1 |
| (c) | 0.00046526 ÷ 2 = 0.00023263  0.00023263 x 10 000 ~ 2 | * Identifies half the probability * Calculates number in sample | 1  1 |
| (d) | 0.00006334 ÷ 2 = 0.00003167  To get 3 multiply by 100 000  (95 000) | * Identifies half the probability * Determines sample size | 1  1 |
| (e) | 1 ÷ 0.04550026 ~22 | * Identifies division by probability | 1 |