Commentary on candidate evidence

The evidence for the following candidate responses achieved the marks given below.

Response 1
Question 3(a)

The candidate was awarded **1/3 marks.**

- •[1] incorrect response **(0 marks)**
- •[2] correct disadvantage described **(1 mark)**
- •[3] no response given for the possible consequence to the researcher **(0 marks)**

Question 3(b)

The candidate was awarded **1/3 marks.**

- •[4] no description of consecutive numbering of all of the books in the sampling frame **(0 marks)**
- •[5] omission of reference to the generation of a <u>random</u> starting number **(0 marks)**
- •[6] this description of systematic sampling is not the expected response, but it leads to the same net effect. (**1 mark**)

Response 2
Question 6(a)

The candidate was awarded **2/2 marks**.

- •[1]   correct response, using the phrase 'nominal data' instead of categorical data **(1 mark)**
- •[2]   correct response **(1 mark)**

Question 6(b)

The candidate was awarded **2/5 marks.**

- •[3]   assumption was too vaguely phrased with no reference to context of question **(0 marks)**
- •[4]   candidate's 'bubble' to represent critical value multiplier is not acceptable for communicating the intended strategy **(0 marks)**
- •[5]   correct responses for both sample mean and sample standard deviation **(1 mark)**
- •[6]   incorrect critical value from Z distribution, rather than from t distribution **(0 marks)**
- •[7]   consistent confidence interval from candidate's earlier written calculation **(1 mark)**

Question 6(c)

The candidate was awarded **1/2 marks**.

- •[8]   this mark is not available to candidates who used a z value in mark •[6], due to resulting simplification of working **(0 marks)**
- •[9]   consistent answer of just 'Birch' **(1 mark)**

Question 6(d)

The candidate was awarded **2/3 marks**.

- •[10]   incorrect t-value **(0 marks)**
- •[11]   consistent confidence interval from candidate's earlier written calculation **(1 mark)**
- •[12]   response consistent with the candidate's earlier written calculation **(1 mark)**

Response 3

Question 8(c)

The candidate was awarded **4/6 marks.**

- [4]   correct hypotheses, with benefit of the doubt given to the writing of rho that ought to have been written as ρ , and not as p **(1 mark)**
- [5]   correct test statistic **(1 mark)**
- [6]   correct critical value from t_{35} **(1 mark)**
- [7]   correct decision regarding H_0, but there is no need to mention H_1 **(1 mark)**
- [8]   no concluding statement **(0 marks)**
- [9]   assumptions were not contextualised to the question **(0 marks)**

Response 4

Question 10(a)

The candidate was awarded **5/5 marks.**

- [1]   correct response **(1 mark)**
- [2]   correct response **(1 mark)**
- [3]   acceptable use of a p-value, instead of a critical value **(1 mark)**
- [4]   acceptable response that clearly included the level of significance **(1 mark)**
- [5]   acceptable response that clearly included the level of significance **(1 mark)**

Question 10(b)

The candidate was awarded **4/4 marks.**

- [6]   correct response **(1 mark)**
- [7]   correct response **(1 mark)**
- [8]   correct response **(1 mark)**
- [9]   correct response **(1 mark)**

Question 10c)

The candidate was awarded **3/3 marks.**

- [10]   correct reference to sample variance **(1 mark)**
- [11]   correct reference to estimate population variance **(1 mark)**
- [12]   correct reference to use of a t-test **(1 mark)**

Note that the reference to the Central Limit Theorem was not needed for 10c). The question stated that the parent distribution was normal, so the Central Limit Theorem was not required. The use of the sample variance as an approximation for the population variance does not require the Central Limit Theorem. The candidate's reference to the Central Limit Theorem was not penalised as there was sufficient evidence for it not to undermine the awarding of the last 3 marks.

Response 5

Question 10(c)

The candidate was awarded **3/3 marks** because their response contained all of the required information. This response is an exemplification of the succinctness that can be written by candidates which can gain full marks.

Response 6

Question 12(a)

The candidate was awarded **5/5 marks**.

- $\bullet^1$ correct response for the values of X
- $\bullet^2$ & $\bullet^3$ correct probabilities, although legibility of handwriting was poor
- $\bullet^4$ correct answer by expected method
- $\bullet^5$ correct answer. The candidate employed a method similar to that used by National 5 Mathematics candidates when working out standard deviations, rather than using $E(X^2)$ and $V(X)=E(X^2)-E^2(X)$. This (longer) method is not incorrect and therefore gained the mark.

Question 12(bii)
The candidate was awarded **1/5 marks.**

- $\bullet^6$ calculation looks correct but the incorrect answer does not gain the mark **(0 marks).**
- $\bullet^7$ it's unclear if the correct calculation is being used due to apparent negative value being substituted for V(Y). This candidate would have benefitted from first writing the algebraic formula and then substituting in the appropriate values. **(0 marks)**
- $\bullet^8$ an incorrect and negative value for V(Y) was used **(0 marks)**
- $\bullet^9$ incorrect assumption **(0 marks)**
- $\bullet^{10}$ an acceptable response that referenced the comparison between the calculated expected profit and standard deviation, and the likelihood of a loss as a result. **(1 mark)**

    NB: Candidates should be encouraged to write as clearly as possible to ensure they gain the maximum number of marks available.