Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1	a		The appropriate inferential statistical test is the Mann Whitney U test. This is because … (i) It is a test of the difference between two conditions (and the study was investigating the difference in ratings for premium and budget crisps) (ii) It is a test that is used with independent measures designs (and the experiment had different people rating the premium crisps compared to rating the budget crisps), and (iii) It is a test that requires ordinal level data (ratings of the tastiness of crisps on a scale 1 to 20 is ordinal because the outcomes can be ranked) The candidate has not provided any creditworthy information Appropriate test named and justified with more than one clear reason in context Appropriate test named and justified with one clear reason in context Appropriate test named and justified, but not in context Appropriate test named and attempt to justify why (whether in context or not) The candidate has not provided any creditworthy information	Max 4 0 4 3 2 1 0	-Context = crisps, premium and / or budget brand and tasty / tastiness -Context needs to be expressed in relation to justifying choice of test (just saying as a standard lead sentence … 'In this study about taste and crisps …. 'is not acceptable for context here) -If incorrect test named = zero, regardless of whether any justification is provided or not (and regardless of whether the justification relates to the correct test) -Cap at 2 marks if correct test named and reasons given, but one is incorrect (e.g. saying nominal rather than ordinal data) **Examiner's Comments** Many candidates struggled with this question and seemed to make a guess from any of the names of inferential statistical tests they could remember. This highlights the importance of making sure knowledge of the criteria for using the five inferential statistical tests in the specification is covered adequately. The best responses correctly identified the test then provided two justifications in context of the research presented.
	b		It would be obtained from a table of critical values using the number of participants in each condition (12) to look up the appropriate figure to use Clear explanation of how to find the critical value Attempt to explain of how to find the critical value The candidate has not provided any creditworthy information	Max 2 2 1 0	-1 mark if just stating something like … 'use table of critical values' -Reference to tables of critical values for the wrong test (e.g. Chi square) = zero -Reference to number of participants alone is not creditworthy **Examiner's Comments**

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td>There was much confusion here regarded what the term ‘critical value’ refers to, with some candidates incorrectly assuming it was something obtained directly from the calculation of the inferential statistical test itself (e.g. as in ‘expected values’ from the Chi square test). Worst still, some discussed aspects of descriptive statistics, such as the mean or standard deviation. This highlights the importance of the need to actually perform some calculations using the inferential tests and gain familiarity with the use of tables of critical values and their role in significance testing.</td></tr>
<tr><td></td><td>c</td><td></td><td>2 marks for each conclusion

In this study p<0.05 would mean that there is a less than 5% probability that null hypothesis (which states there would be no difference in how premium and budget brand crisps tasted) was true. Therefore, we can conclude that people regard premium brand crisps as being tastier than budget brand crisps. This means that things other than actual taste of crisps can influence our perception of what they are like. Things such as the appearance of the packaging of the crisps and the labels used to describe them.
Clear and detailed conclusion outlined in context with correct reference to both the null and alternative hypothesis
Clear and detailed conclusion outlined in context with correct reference to either the null or alternative hypothesis

<table><tr><td>Clear and detailed conclusion, but not outlined in context</td><td>OR attempt to outline conclusion in context</td></tr></table>
Brief and / or weak attempt to outline conclusion, whether in context or not
The candidate has not provided any creditworthy information</td><td>Max 4

4

3

2

1

0</td><td>-Context = crisps, premium and / or budget brand and tasty / tastiness

-For 4 marks must include reference to rejecting the null and accepting the alternative hypothesis in context

-Reference to alternative and null hypotheses can be implicit – e.g. stating that there is a significant difference between the ratings of the two different brands of crisps (this is creditworthy as H_1)

<u>Examiner’s Comments</u>

Candidates who struggled with the previous two related questions also found this question about probability levels and significance testing difficult to comprehend (with some not attempting an answer at all). Once again, the importance of actually carrying out some calculations using the inferential tests is highlighted in order to become aware of what happens after the answer from such tests is obtained that allows hypotheses to be accepted or rejected.</td></tr>
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			Total	**10**	
2	a		The range only compares the highest and lowest value, subtracting one from the other, whereas the standard deviation compares each individual score with the mean. Clear outline of one way the range and standard deviation are different Attempt to outline of one way the range and standard deviation are different The candidate has not provided any creditworthy information	Max 2 2 1 0	-For two marks some acknowledgement of the fact that SD takes in to account ALL the data collected is required -If just describing how to calculate one of the measures of dispersion, with no comparison of how this is different to the other (or if the point of comparison is incorrect) = zero marks -Accept as a difference the difficulty of calculating the SD compared to the range **Examiner's Comments** This question required knowledge of both the range and the standard deviation. It was not sufficient just to describe what the range is / how it is calculated on its own. Many candidates did not seem to know what the standard deviation was or the basics of how it is calculated in order to access marks for this question. The best responses here outlined how the standard deviation includes all the data collected in its calculation, compared to using just the two extremes like the range.
	b		Examples could include … -People vary a lot in how they rate the tastiness of premium and budget brand crisps -There is more variation in peoples' ratings of the tastiness of the budget crisps than the premium brand crisps. This means some people seem to think they are very tasty, whereas others do not regard them as tasty at all **2 marks for each conclusion** Clear conclusion outlined in context Clear conclusion outlined but not **OR** attempt to outline conclusion in context in context	Max 4 2 1 0	-Context = crisps, premium and / or budget brand and tasty / tastiness -Cap at 1 mark maximum out of 4 overall if only results / findings presented with no attempt to interpret what they suggest and no conclusion. If there is one finding and one clear conclusion in context = 3 marks, or 2 marks if the conclusion is not in context / attempted in context) -Zero marks if findings presented which are incorrect (e.g. claiming that the range for the budget brand crisps was 16 which means people really liked the taste of them etc) -Range for 'Premium brand' … 20 - 8 = 12 (also accept +1 in calculation, = 13)

			The candidate has not provided any creditworthy information		-Range for 'Budget brand' … 18 - 2 = 16 (also accept +1 in calculation, = 17) **Examiner's Comments** It was important for this question to understand that a conclusion is not simply a result / finding from a piece of research – it is the interpretation of a finding. Furthermore, many candidates here confused the range with a measure of central tendency (e.g. the mean), incorrectly claiming that the higher the range the greater the preference was. The best responses here quoted what the range was first then went on to speculate what this implied in terms of how much agreement there was or not amongst participants in the respective conditions of the experiment. This shows how, although simple and straightforward the range is in terms of how it is calculated, it is important to spend time covering what it actually informs us about the outcomes of a piece of research when used in an applied way.
			Total	**6**	
3			B	1	**Examiner's Comments** There were a mixture of responses here to this question requiring knowledge of selection of inferential statistical test which demonstrates the need to become familiar with the criteria for use of each of the five inferential tests on the specification
			Total	**1**	
4			C	1	**Examiner's Comments** Surprisingly, some candidates struggled with this question, with a mixture of response options being selected
			Total	**1**	

5			D	1	**Examiner's Comments** This question proved to be quite difficult for candidates and highlights the need to cover all the different types of validity on the specification
			Total	**1**	
6			A	1	**Examiner's Comments** Mostly correct answers
			Total	**1**	
7	a		A	1	
	b		C	1	
	c		C	1	**Examiner's Comments** All these related questions concerning the understanding and interpretation of data presented in a histogram proved challenging to many candidates and demonstrates the importance of covering graphical displays in detail and not relying upon a transfer of existing knowledge perhaps from level 2 mathematics courses undertaken by students prior to embarking on the AS Psychology course
			Total	**3**	
8			Scatter diagram (accept 'scattergraph' or 'scattergram' also) AO1: 1 mark for correct naming of scatter diagram (or scattergraph or scattergram) Scatter diagram (or scattergraph or scattergram) correctly named The candidate has not provided any creditworthy information	Max 1 1xAO1 mark 1 0	-Also accept 'scattergraph' and 'scattergram' **Examiner's Comments** Mostly correct answers here (with occasional, incorrect references to 'line graphs')
			Total	**1**	
9			For example: keeping participants naïve; anonymous responses;	Max 4	-Context = reference to TV and / or snacks

			inclusion of other, unrelated questions (distractor / filler questions); providing data / completing study outside of a research context etc Clear explanation of how to reduce social desirability in context Clear explanation of how to reduce social desirability, but not in context **OR** attempt in context Attempt to explain how to reduce social desirability but not in context Brief and / or weak attempt to explain how to reduce social desirability whether in context or not The candidate has not provided any creditworthy information	4 3 2 1 0	-The explanation for reducing social desirability can refer to either variable, or both of them together **Examiner's Comments** Some candidates clearly did not understand what the term 'social desirability' refers to (and some confused it with demand characteristics in general). The best responses were ones characterised by providing a definition of the term first, before a detailed discussion in context of an appropriate strategy to reduce social desirability that provided explicit examples.
			Total	**4**	
10			Criterion validity (or 'predictive validity') assesses how well one measure predicts an outcome for another (related) measure. Here, it refers to how well the measures taken to investigate the relationship between the amount of TV viewed and the number of snacks consumed would compare to different measures of the same thing, such as using weight gain instead of the number of snacks consumed. Clear explanation of what criterion validity refers to in context Clear description of what criterion validity refers to but not in context **OR** attempt in context Brief and / or weak attempt to explain what criterion validity refers to, whether in context or not	Max 3 3 2 1 0	Context = reference to TV and / or snacks Accept reference to 'predictive validity' -Award one mark for discussion of validity in general (and cap at this if no explanation of criterion validity specifically) **Examiner's Comments** This proved to be a very challenging question, with very few candidates achieving all 3 marks on offer. This highlights the importance of covering all the many different types of validity on the specification. Those that did demonstrate an understanding (often using the term 'predictive validity', which was perfectly acceptable) sometimes struggled to provide an example in context of the research proposed that would convey a detailed understanding.

			The candidate has not provided any creditworthy information		
			Total	**3**	
11	a		Quantitative data is information about the quantity of something that is expressed in numbers, rather than words Clear explanation of what quantitative data is Attempt to explain what quantitative data is The candidate has not provided any creditworthy information	Max 2 2 1 0	-1 mark if literally just saying 'numbers' without any attempt to explain what is meant by numbers. -Examples of 2 mark responses could include … 'findings', 'data recorded in numbers', or 'the measurement of a variable or aspect of persons behaviour' -'Numbers that are easy to analyse and compare' = 2 marks **Examiner's Comments** Most candidates were able to explain what quantitative data refers to (the clearest responses were those that included an example)
	b		Advantages include … -Able to perform more descriptive statistics (e.g. calculate the mean of the tastiness of each brand of crisp) -More objective -Easier to analyse and present findings -Easier to compare results across conditions Clear and detailed outline of advantage in context Clear outline of advantage, but not in context **OR** attempt in context Brief and / or weak attempt to outline advantage (whether in context or not) The candidate has not provided any creditworthy information	Max 3 3 2 1 0	-Context = crisps, premium and / or budget brand and tasty / tastiness -Accept any reference to study details (e.g. participant numbers) as context -For 3 marks must be some comparison with qualitative data in discussing strength -Cap at 1 mark if there is no reference to qualitative data at all in answer (whether in context or not). However, candidates may refer to 'data being in words', rather than using the 'qualitative', and this IS acceptable. **Examiner's Comments** Most candidates were able to outline advantage of quantitative data. However, this was not always done in the context of the research presented and not always in comparison with qualitative data (which the question asked for). The best responses here began with an outline in general of an advantage of quantitative data, then went on to provide an example of this in the context of the study and making a contrast to why this was an advantage compared to qualitative data.

<table>
<tr><td></td><td></td><td></td><td>Total</td><td>5</td><td></td></tr>
<tr><td>12</td><td></td><td></td><td>A</td><td>1</td><td><u>Examiner's Comments</u>
This proved to be a challenging question and shows the importance of teaching terms and concepts well</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>13</td><td></td><td></td><td>A</td><td>1</td><td><u>Examiner's Comments</u>
Most candidates were able to identify this was a negative correlation but some struggled with the strength of the correlation</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>14</td><td></td><td></td><td>A</td><td>1</td><td><u>Examiner's Comments</u>
Generally quite poorly answered and shows the need to prepare candidates to answer questions related to choice of inferential statistical tests</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>15</td><td></td><td></td><td>A</td><td>1</td><td><u>Examiner's Comments</u>
Mostly correct</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>16</td><td></td><td></td><td>C</td><td>1</td><td><u>Examiner's Comments</u>
Generally well answered</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>17</td><td></td><td></td><td>Ethical issues could include: causing elderly residents distress by discussing loneliness with them; issues of safety around animals; interaction with people they are not familiar with (distress); may not fully understand what to research is about (consent); may become attached to animals and not want it taken away etc
3 marks for each ethical issue
Ethical issue clearly identified and way to address it clearly explained in context
<table><tr><td>Ethical issue clearly identified and way to address it clearly</td><td>OR Ethical issue clearly identified and way to address it clearly</td></tr></table></td><td>Max 6

3

2

1</td><td>-Context = pets, loneliness, features of the residents of the home (e.g. elderly)

<u>Examiner's Comments</u>
This question required two appropriate ethical considerations to be identified and addressed. The best responses here were characterised by candidates who presented two separate ethical issues in turn, first by identifying what the ethical issue was and why it was an issue and then going on to explain how it could be addressed. This also needed to be done in context of the research outlined to achieve the highest band marks.</td></tr>
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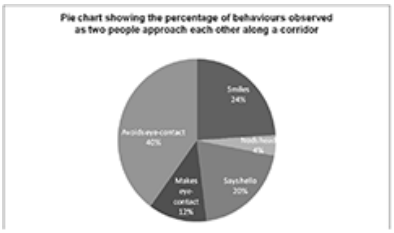
			explained in context / explained, but not in context Attempt to identify ethical issue and attempt to explain how to address it (whether in context or not) / **OR** clearly identified ethical issue with no suggestion of how to address it The candidate has not provided any creditworthy information	**0**	
			Total	**6**	
18			The level of data obtained in the study is nominal. The candidate has not provided any creditworthy information	**Max 1** **0**	**Examiner's Comments** Although the majority of candidates answered this question correctly some responded with incorrect alternatives revealing that they did not have a good understanding of different levels of data (some incorrectly stated 'ordinal' and some 'interval'). Some also confused levels of data with 'types of data' (primary or secondary).
			Total	**1**	
19			The ratio is 2:1 Correctly stated ratio, simplified to 2:1 Just saying 80:40 without simplifying the answer The candidate has not provided any creditworthy information	**Max 1** **2** **1** **0**	-80:40 is creditworthy for 1 mark **Examiner's Comments** Most candidates demonstrated a good understanding of the concept of ratio in response to this question and went on to present their answer in its simplest form.
			Total	**2**	
20			The mode 'avoids eye-contact' (with 80 occurrences) Correctly stating the mode as 'avoids eye-contact' The candidate has not provided any creditworthy information	**Max 1** **1** **0**	Accept figure '80' as correct answer **Examiner's Comments** Most candidates demonstrated understanding of what the mode is as applied to the data collected from this study.
			Total	**1**	

21			 1 mark is awarded for correctly calculating what proportion of the circle should represent each of the five behavioural categories. 1 mark is awarded for drawing the sectors in proportional size to the data displayed 1 mark is awarded for clear labelling of each sector of the pie chart 1 mark is awarded for a clear and appropriate title All features included 3 features included 2 features included 1 feature included The candidate has not provided any creditworthy information	**Max 4** **4** **3** **2** **1** **0**	-Sectors of the pie chart need only be approximate sizes (examiners do not need to check with protractor or overlay in RM assessor) -Calculations can be percentages and / or degrees (decimal places or whole figures) of circle (within labeling of the pie chart, or separately at the side) Avoids eye contact: 40% = 144 degrees Smiles: 24% = 86.4 degrees Nods head: 4% = 14.4 degrees Says hello: 20% = 72 degrees Makes eye-contact: 12% = 43.2 degrees **Examiner's Comments** In order to achieve full marks on this question candidates needed to sketch a pie chart with sectors drawn in proportion to the amount of responses recorded for each of the five categories of behaviours studied. In order to do this accurately candidates needed to calculate what percentage, or proportion of the circle (in degrees) needed to be used to represent each of the behavioural categories. The answers to these calculations needed to be evident within the labelling of the pie chart or presented separately at the side. Candidates also needed to provide clear labels and an overall title. It was clear that some candidates struggled with this question by the fact that there were several different attempts to draw the sectors of the pie, with lots of crossing and rubbing out of original lines leading to a scruffy response at times. It is worth practicing drawing pie charts using a compass and protractor to get students used to this type of question.
			Total	**4**	
22			Conclusions could include: the most frequent behaviour was to avoid eye-contact, which suggests people do	**6**	-Context = corridor, workplace, office worker etc

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<td>not like acknowledging each other in a corridor; The lowest frequency of behaviour was ‘nods head’, which suggests people do not like greeting people as they meet in a corridor.

Accept any other appropriate conclusions here.

3 marks for each conclusion
Clear, detailed response in context
<table>
<tr><td>Clear, detailed response but not in context</td><td>OR attempt in context</td></tr>
<tr><td>Attempt, whether in context or not</td><td>OR simply stating a finding</td></tr>
</table>
The candidate has not provided any creditworthy information</td>
<td>3
2

1

0</td>
<td>-Simply referring to the behaviour categories (e.g. ‘smiling’) is not sufficient for context here

-Clear (explicit) interpretation of findings
(not simply stating a finding) is required for top band

-For 2 marks could be saying … people avoid each other when approaching in the corridor etc
Do not accept reference to number of people engaging in a certain behavior (as opposed to number of behaviours)

<u>Examiner’s Comments</u>
This question was poorly answered on the whole. Many candidates simply referred to results / findings rather than conclusions (interpretation of findings). Another common misconception was that the total number of recorded behaviours for each category equated to the total number of individual people displaying these behaviours, rather than just the total number of behaviours for each category. If nothing else, this should have been clear from the title of the table, which referred to ‘behaviours’ and not ‘number of people’ exhibiting the behaviours. Candidates who did respond appropriately were able to generate a variety of different conclusions, with the ones achieving the highest marks contextualising their answers (e.g. saying the most common behaviour of avoiding eye contact suggests either people were shy or simply very busy and preoccupied with their work to acknowledge other people as they passed them in the corridor).</td>
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<td></td><td></td><td></td><td>Total</td><td>6</td><td></td>
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<td>23</td><td></td><td></td><td></td><td>Max 3</td><td>-Expression of the percentage in the initial stage of the calculation can be</td>
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</table>

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<td></td><td></td><td></td>
<td>
125 written as a percentage of 310 is
125/310 x 100 = 40.3225806
Expressed to two significant figures this is 40
<table>
<tr><td>AO2 marks</td><td>1 mark is awarded for application of knowledge and understanding of how to convert raw data in to a percentage and a further mark for the application of knowledge and understanding of what significant figures are applied to the data in this study</td></tr>
</table>
Percentage correctly calculated and written to two significant figures
Percentage correctly identified but not written to two significant figures
<table>
<tr><td>Just showing workings (calculations) i.e. 125/310 (x 100)</td><td>OR just stating correct answer without any workings</td></tr>
</table>
The candidate has not provided any creditworthy information
</td>
<td>
3xAO2

3

2

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0
</td>
<td>
written to any number of decimal places

<u>Examiner’s Comments</u>
There was some confusion in this question with decimal places and significant figures. Most candidates successfully performed the calculation to express 125 as a percentage of 310, but then presented the answer to two decimal places rather than two significant figures. It is worth practicing different techniques for producing estimates of data to demonstrate the difference between decimal places and significant figures here.
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<td></td><td></td><td></td><td>Total</td><td>3</td><td></td>
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