# GCE A LEVEL MARKING SCHEME

**AUTUMN 2021**

**A LEVEL**
**PSYCHOLOGY – COMPONENT 2**
**A290U20-1**

**INTRODUCTION**

This marking scheme was used by WJEC for the 2021 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

# GCE A LEVEL PSYCHOLOGY – COMPONENT 2

## AUTUMN 2021 MARK SCHEME

| Question | AO1 | AO2 | AO3 | Total |
|:---:|:---:|:---:|:---:|:---:|
| 1 | 4 | | | 4 |
| 2 | 8 | | | 8 |
| 3 | 6 | | | 6 |
| 4 | 2 | | 6 | 8 |
| 5 | | | 8 | 8 |
| 6 | | | 12 | 12 |
| 7 | | 18 | | 18 |
| 8 | | 12 | | 12 |
| 9 | | 14 | | 14 |
| 10 | | 6 | 4 | 10 |
| Total | 20 | 50 | 30 | 100 |

## SECTION A – Principles of Research

*Answer **all** questions*

1.  (a)  Define the term 'probability value'. [2]

| Credit could be given for: |
| --- |
| Exemplar answers: |
| • A numerical value that gives an indication of the likelihood that results are due to a real difference/correlation and not due to chance factors. (2 marks) |
| • A value that represents the likelihood of a given event. (1 marks) |
| • Any other appropriate content. |

| Marks | AO1 |
| --- | --- |
| 2 | • Thorough definition. |
| 1 | • Basic definition. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b)  Explain why a psychologist would use 0.05 rather than 0.01 as their probability value. [2]

| Credit could be given for: |
| --- |
| Exemplar answers: |
| • We would use 0.05 as this suggests that there is a 5% chance of our results being due to chance, whereas using 0.01 would lower this to a 1% chance which may be too strict. (2 marks) |
| • By using 0.01, instead of 0.05, we may increase the risk of incurring a type II error and incorrectly accept the null hypothesis. (2 marks) |
| • May be too small and they may make a mistake when choosing their hypothesis. (1 mark) |
| • Any other appropriate content. |

| Marks | AO1 |
| --- | --- |
| 2 | • Thorough explanation. |
| 1 | • Basic explanation. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

2. Define the following terms:

   (a) Sampling frame. [2]

   | Credit could be given for: |
   |---|
   | Exemplar answers: |
   | • A group/population that is identified when it is unrealistic to study the whole target population e.g. people in London. (2 marks) |
   | • A sampling frame is a list of all the items in your population. It's a complete list of everyone or everything you want to study. The sampling frame is more specific than the target population. (2 marks) |
   | • A list of people who could be in the research. (1 mark) |
   | • Any other appropriate content. |

   | Marks | AO1 |
   |---|---|
   | 2 | • Thorough definition. |
   | 1 | • Basic definition. |
   | 0 | • Inappropriate answer given. <br> • No response attempted. |

   (b) Aim of the research. [2]

   | Credit could be given for: |
   |---|
   | Exemplar answers: |
   | • A broad statement of the purpose of the research, it is not as specific as a hypothesis. (2 marks) |
   | • A statement as to why research is being done. (1 mark) |
   | • Any other appropriate content. |

   | Marks | AO1 |
   |---|---|
   | 2 | • Thorough definition. |
   | 1 | • Basic definition. |
   | 0 | • Inappropriate answer given. <br> • No response attempted. |

(c)     Confounding variables.                                                        [2]

| Credit could be given for: |
| --- |
| Exemplar answers: |
| • Variables in a study that are not being measured or manipulated by the researcher, that affect SOME participants' behaviours but not others, having negative consequences for validity. (2 marks) |
| • Any other appropriate content. |

| Marks | AO1 |
| --- | --- |
| 2 | • Thorough definition. |
| 1 | • Basic definition. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(d)     Extraneous variables.                                                        [2]

| Credit could be given for: |
| --- |
| Exemplar answers: |
| • Variables in a study that are not being measured or manipulated by the researcher but affect the results (DV) of ALL participants' behaviour equally. (2 marks) |
| • Any other appropriate content. |

| Marks | AO1 |
| --- | --- |
| 2 | • Thorough definition. |
| 1 | • Basic definition. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

3. Explain the format for reporting psychological investigations. [6]

| Credit **could** be given for: |
| --- |

- Investigations normally being published in a journal (print and/or on-line)
- Identification and description of typical content of various key elements in a psychological investigation such as Title; Abstract; Introduction; Methods/Procedures; Results; Discussion/Conclusions; References.
- Abstract: brief summary of the research.
- Introduction: brief summary of relevant literature.
- Methodology: design chosen.
- Procedure: steps that were taken by the researcher.
- Findings/result: data gathered and analysed.
- Discussion of results and conclusion.

- Any other appropriate content.

| Marks | AO1 |
| --- | --- |
| 5-6 | • Reasonable explanation of the format used to report psychological investigations given.<br>• Good use of appropriate terminology. |
| 3-4 | • Basic explanation of the format used to report psychological investigations given.<br>• Some use of appropriate terminology. |
| 1-2 | • Superficial explanation of the format used to report psychological investigations given.<br>• Very little use of appropriate terminology. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

4.    (a)    Explain what is meant by 'on-line research'.                                    [2]

Credit could be given for:

Exemplar answers:

- Where data is collected from the participant via a website, app or other social media device. Participants normally complete questionnaires or are asked their opinions on stimulus materials. [2 marks]

- When the data in the research is collected on-line, rather than face to face. [1 mark]

- Research that is done on-line. [0 marks]

- Any other appropriate content.

| Marks | AO1 |
|-------|-----|
| 2 | • Reasonable explanation. |
| 1 | • Basic explanation. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b) Critically assess the strengths and weaknesses of conducting research in a laboratory environment. [6]

| Credit could be given for: |
| --- |
| **Strengths of research in a laboratory environment:** <br> • Allows the researcher to more easily control confounding or extraneous variables. <br> • Allows the researcher to more easily use equipment, such as an MRI scanner. <br><br> **Weaknesses of research in a laboratory environment:** <br> • Participants are in an artificial environment and so may behave artificially. <br> • Some research can't be done in a laboratory, because of the nature of the behaviour e.g. studying primates in their natural habitats. <br><br> • Any other appropriate content. |

| Marks | AO3 |
| --- | --- |
| 5-6 | • Reasonable assessment of strengths and weaknesses of research conducted in a laboratory environment, used in psychology. <br> • Depth and range, but may not be in equal measure. <br> • Structure is logical. |
| 3-4 | • Basic assessment of strengths and weaknesses of research conducted in a laboratory environment, used in psychology. <br> • Depth or range. <br> • Structure is reasonable. <br> OR <br> • Reasonable assessment of strengths or weaknesses of research conducted in a laboratory environment, used in psychology. <br> • Depth and range, but not in equal measure. <br> • Structure is logical. |
| 1-2 | • Superficial assessment of strengths and weaknesses of research conducted in a laboratory environment, used in psychology. <br> • Answer lacks structure. <br> OR <br> • Basic assessment of strengths or weaknesses of research conducted in a laboratory environment, used in psychology. <br> • Depth or range. <br> • Structure is reasonable. |
| 0 | • Inappropriate answer given. <br> • No response attempted. |

5.   (a)   Evaluate the use of quantitative data in psychology.   [4]

| Credit could be given for: |
| --- |
| **Strengths**:<br>• Data is easy to analyse using statistics.<br>• Easier to collect from a large group of participants.<br><br>**Weaknesses**:<br>• Tends to lose the 'human' level of behaviour.<br>• Tends to offer a very shallow view of behaviour.<br><br>• Any other appropriate content. |

| Marks | AO3 |
| --- | --- |
| 4 | • Thorough evaluation of quantitative data.<br>• Evaluative comments are evidently relevant to psychology.<br>• Structure is logical throughout.<br>• Depth and range included. |
| 3 | • Reasonable evaluation of quantitative data.<br>• Evaluative comments show some relevance to psychology.<br>• Structure is mostly logical.<br>• Depth and range, but not in equal measure. |
| 2 | • Basic evaluation of quantitative data.<br>• Evaluative comments are generic and may have minimal relevance to psychology.<br>• Structure is reasonable.<br>• Depth or range. |
| 1 | • Superficial evaluation of quantitative data.<br>• Evaluative comments have minimal relevance to psychology.<br>• Answer lacks structure. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b)    Evaluate the use of qualitative data in psychology.                    [4]

Credit could be given for:

**Strengths**:
- Can offer a more individualised, 'human' view of behaviour.
- Provides in-depth, detailed data.

**Weaknesses**:
- Can be difficult to analyse collected data.
- Data tends to come from limited range of people.

- Any other appropriate content.

| Marks | AO3 |
|-------|-----|
| 4 | • Thorough evaluation of qualitative data.<br>• Evaluative comments are evidently relevant to psychology.<br>• Structure is logical throughout.<br>• Depth and range included. |
| 3 | • Reasonable evaluation of qualitative data.<br>• Evaluative comments show some relevance to psychology.<br>• Structure is mostly logical.<br>• Depth and range, but not in equal measure. |
| 2 | • Basic evaluation of qualitative data.<br>• Evaluative comments are generic and may have minimal relevance to psychology.<br>• Structure is reasonable.<br>• Depth or range. |
| 1 | • Superficial evaluation of qualitative data.<br>• Evaluative comments have minimal relevance to psychology.<br>• Answer lacks structure. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

6. (a) Explain **two** ways in which Kohlberg's (1968) research '*The child as a moral philosopher*' could be improved. [3+3]

Credit could be given for:

- Change to the interviewer/use of a naïve confederate.
- Changes to the sampling technique used.
- Changes to the moral dilemmas used.
- Any other appropriate content.

| Marks | AO3 |
|-------|-----|
| 3 | <ul><li>A way of improving the research is suggested.</li><li>Thorough analysis of why this suggestion would improve the research.</li><li>The structure is logical.</li></ul> |
| 2 | <ul><li>A way of improving the research is suggested.</li><li>Reasonable analysis of why this suggestion would improve the research.</li><li>The structure is logical.</li></ul> |
| 1 | <ul><li>A way of improving the research is suggested.</li><li>No analysis of why this suggestion would improve the research.</li><li>Answer lacks structure.</li></ul> |
| 0 | <ul><li>Inappropriate answer given.</li><li>No response attempted.</li></ul> |

(b)     Explain **two** ways in which Milgram's (1963) research '*Behavioural study of Obedience*' could be improved.                                    [3+3]

| Credit could be given for: |
| --- |

Credit could be given for:

- Changes to the nature of obedience task.
- Changes to the sampling technique used.
- Changes to the ways in which the ethical issues were dealt with.
- Any other appropriate content.

| Marks | AO3 |
| --- | --- |
| 3 | <ul><li>A way of improving the research is suggested.</li><li>Thorough analysis of why this suggestion would improve the research.</li><li>The structure is logical.</li></ul> |
| 2 | <ul><li>A way of improving the research is suggested.</li><li>Reasonable analysis of why this suggestion would improve the research.</li><li>The structure is logical.</li></ul> |
| 1 | <ul><li>A way of improving the research is suggested.</li><li>No analysis of why this suggestion would improve the research.</li><li>Answer lacks structure.</li></ul> |
| 0 | <ul><li>Inappropriate answer given.</li><li>No response attempted.</li></ul> |

**SECTION B**

7. (a) State a fully operationalised hypothesis for your questionnaire study. [2]

Exemplar answers:

- People will report higher scores on a well-being scale, such as Satisfaction with Life Scale (SWLS) or the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), after doing a 30-minute workout than before doing the workout. [2 marks]

- There will be no difference between the score of well-being on a scale, such as Satisfaction with Life Scale (SWLS) or the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) between the group who had ran one lap of the track and the group who had stood at the side of the track. [2 marks]

- Students will say that they felt better on a well-being scale after going to the gym than before going to the gym. [1 mark]

- People who do exercise will score higher on a well-being scale than those who do not do exercise. [1 mark]

- Any other appropriate content.

| Marks | AO2 |
|---|---|
| 2 | • Appropriate fully operationalised hypothesis stated. |
| 1 | • Appropriate basic hypothesis stated. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b)     Describe **two** ethical issues you considered in your questionnaire study and explain how you dealt with each of these ethical issues.          [4+4]

Exemplar answers:
- People may not have felt good about themselves in general and by answering my questions about exercise or well-being, it may highlight their negative feelings which has caused them distress. I explained that the participant could withdraw from the study at any time without consequences so that if they felt embarrassed, they could stop answering the questions about their well-being. [4 marks]

- I could not tell the participants the full aim of my study because this could have caused social desirability bias if they told me that they did more exercise than they actually did. This means that they were deceived as to the study they were consenting to take part in. To deal with this, I explained what the questions would be about, so that anyone who had negative feelings could decline to take part and not be distressed. [3 marks]

- People may be embarrassed to tell me how much exercise they do so I kept their data anonymous by giving the students an ID number rather than their names [2 mark]

- I could not tell the students the full aim of the study because this could have caused social desirability bias. [1 mark]


For each issue:
- One mark for explaining appropriate ethical issue that is relevant to the research.
- One mark for clearly linking the appropriate ethical issue to this research.
- One mark for suggesting an appropriate way of managing the risk posed by ethical issue in this research.
- One mark for clearly linking the appropriate way of managing the risk posed by ethical issue to this research.

- Any other appropriate content.

(c)     Explain **one** issue of internal reliability that you considered in your
        questionnaire study.                                                    [2]

<table>
<tr><td colspan="2">

Exemplar answers:

- Some of the questions may not have been asking the same thing about the amount of exercise, for example, how many times you attend the gym does not necessarily measure exercise. [2 marks]

- Not all questions I asked could have been about exercise. [1 mark]

- Any other appropriate content.

</td></tr>
</table>

| Marks | AO2 |
|-------|-----|
| 2 | • Reasonable explanation of an appropriate issue of internal reliability clearly linked to this investigation. |
| 1 | • Basic explanation of an appropriate issue of internal reliability linked to this investigation. <br> OR <br> • Reasonable explanation of an appropriate issue of internal reliability not clearly linked to this investigation. |
| 0 | • Inappropriate answer given. <br> • No response attempted. |

(d) Another student carried out correlational research on exercise and wellbeing with five participants. The data collected from these participants is shown in the table below:

| Participant Number | Number of minutes spent exercising | Scores on a well-being scale 0-10 |
|---|---|---|
| 1 | 20 | 8 |
| 2 | 25 | 8 |
| 3 | 15 | 6 |
| 4 | 10 | 3 |
| 5 | 12 | 5 |

$$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Calculate the standard deviation of the number of minutes spent exercising. Show your workings. [6]

One mark for each stage:

One mark for calculating the mean
One mark for scores minus the mean $(x - \bar{x})$
One mark for scores minus the mean$^2$ $(x - \bar{x})^2$
One mark for the sum of scores minus the mean$^2$ $\sum(x - \bar{x})^2$
One mark for sum of scores minus the mean$^2$ divided by N-1

$$\frac{\sum(x - \bar{x})^2}{N - 1}$$

One mark for square root of the sum of scores minus the mean$^2$ divided by N-1

Exemplar answer:

| Participant Number | Number of minutes spent exercising $x$ | Mean $\bar{x}$ | Score – mean $(x - \bar{x})$ | $(x - \bar{x})^2$ |
|---|---|---|---|---|
| 1 | 20 | 16.4 | 3.6 | 12.96 |
| 2 | 25 | 16.4 | 8.6 | 73.96 |
| 3 | 15 | 16.4 | -1.4 | 1.96 |
| 4 | 10 | 16.4 | -6.4 | 40.96 |
| 5 | 12 | 16.4 | -4.4 | 19.36 |

149.2/4= 37.3
Square root of 37.3 = 6.107372593840988 or 6.11.


N.B: If a student miscalculates at any point in the chain only 1 mark will be deducted for each error.

If only the standard deviation is given, without calculations, maximum 1 mark.

8.    (a)    Explain how you fully operationalised the two co-variables in your
            correlational study.                                                 [2+2]

<table>
<tr><td colspan="2">

Exemplar answers:

- Time spent revising was operationalised as the number of hours spent learning the material for the test in one week [2 marks] and scores on a test was measured as the number of correct answers to the ten questions on a knowledge test. [2 marks]

- The number of hours a student spent revising [1 mark] and the number of correct answers on a test. [1 mark]

- Any other appropriate content.

</td></tr>
</table>

| Marks | AO2 |
|:---:|---|
| 2 | • Appropriate clearly operationalised co-variable stated. |
| 1 | • Appropriate partially operationalised co-variable stated. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b) (i) With reference to your correlational study, explain **one** issue of validity. [2]

> Exemplar answers:
>
> - One issue was that the participants could have been lying when they said how many hours a week they revised, and this will lower the validity of the findings because the data about their performance is not true [2 marks].
>
> - One issue is that the participants could lie making the study not a valid representation of their performance [1 mark].
>
> - One issue was that using an opportunity sampling technique meant that only girls were available in the library on that day which made the sample biased, which would lower the population validity of the data on performance [2 marks].
>
> - The sample could have been biased because it was all girls and this lowers the population validity of my study [1 mark].
>
> - Any other appropriate content.
>
> | Marks | AO2 |
> |---|---|
> | 2 | - Reasonable explanation of an appropriate issue of validity clearly linked to this investigation. |
> | 1 | - Basic explanation of an appropriate issue of validity linked to this investigation. <br> OR <br> - Reasonable explanation of an appropriate issue of validity not clearly linked to this investigation. |
> | 0 | - Inappropriate answer given. <br> - No response attempted. |

(ii) Explain **one** way of dealing with the issue identified in 8 (b) (i). [2]

| Exemplar answers: |
|---|
| • Students could have revised in the library and a member of staff would record the time so that the students could not lie, improving the validity of the study. [2 marks] |
| • A representative sampling technique could be used, such as random sampling, so that there was less chance that the sample would be all girls, improving the population validity of the study. [2 marks] |
| • Students could have revised supervised by a teacher. [1 mark] |
| • I could have used random sampling to avoid bias by asking all of the girls. [1 mark] |
| • Any other appropriate content. |

| Marks | AO2 |
|---|---|
| 2 | • Reasonable explanation of an appropriate way of dealing with the issue of validity clearly linked to this investigation. |
| 1 | • Basic explanation of an appropriate way of dealing with the issue of validity linked to this investigation.<br>OR<br>• Reasonable explanation of an appropriate way of dealing with the issue of validity not clearly linked to this investigation. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(c) (i) Identify the inferential statistical test that you used when analysing the data collected in your correlational study. [1]

| Credit could be given for: |
|---|
| • Spearman's rank order correlation coefficient.<br>• Pearson Product Moment correlation. |
| • Any other appropriate content. |

| Marks | AO2 |
|---|---|
| 1 | • Appropriate inferential statistical test identified. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(ii)     Fully justify your choice of the inferential statistic identified in 8 (c) (i)

[3]

Exemplar answers:

- I used a Spearman's test as I was looking for a correlation between the number of minutes spent revising and the score on a knowledge test, which are both at least ordinal level data. As each participant contributed the number of minutes they had spent revising and their research methods terms test score, then the data is related.
[3 marks]

- As the investigation is a correlation; the data on two co-variables (minutes spent revising and mock exam score) is at least ordinal level data; all participants reported the number of minutes spent revising and the score they got on the test, so the data is related.
[2 marks]

- I used this test as I was correlating hours spent revising and test result; the data on both co-variables is at least ordinal level and it is related. [1 mark]

- I used this test as it is a correlation, the data is ordinal or above and the data is related [0 marks]

- Any other appropriate content.

| Marks | AO2 |
|---|---|
| 3 | All of the following conditions included in the justification: <br> • Test of correlation/association noted and linked to research. <br> • Level of measurement noted and linked to research. <br> • Related data noted and linked to research. |
| 2 | Two of the following conditions included in the justification: <br> • Test of correlation/association noted and linked to research. <br> • Level of measurement noted and linked to research. <br> • Related data noted and linked to research. |
| 1 | One of the following conditions included in the justification: <br> • Test of correlation/association noted and linked to research. <br> • Level of measurement noted and linked to research. <br> • Related data noted and linked to research. |
| 0 | • Justification is given but not linked to the research. <br> • Test of correlation; ordinal or above data; data is related. <br> • Inappropriate answer given. <br> • No response attempted. |

## SECTION C – Application of research methods to a novel scenario

*Answer **all** questions*

9.  A sports psychologist was interested in the effect a crowd may have on athletes' performance. She decided to investigate by comparing the time taken to run 200m with and without a crowd. She put 20 athletes into pairs by matching them based on their personal best time over 200m from the previous season. She then assigned one athlete from the pair to run 200m in a stadium in front of a crowd and the other athlete from the pair to run in the same stadium when there was no crowd. She measured the time it took for all athletes to complete a 200m race.

| Pair | Time taken to complete 200m race with a crowd (seconds) | Time taken to complete 200m race without a crowd (seconds) |
|------|---------------------------------------------------------|------------------------------------------------------------|
| A | 23.61 | 24.31 |
| B | 25.6 | 24.63 |
| C | 24.04 | 25.09 |
| D | 26.34 | 26.87 |
| E | 23.56 | 24.21 |
| F | 27.08 | 27.58 |
| G | 23.09 | 24.29 |
| H | 24.67 | 25.63 |
| I | 22.87 | 23.66 |
| J | 24.84 | 25.23 |

(a) The sports psychologist found that the mean time taken to complete the 200m race with a crowd was 24.57 seconds.

Showing your workings, calculate the mean time taken to complete the 200m race without a crowd. [2]

Credit given for appropriate answer and calculations:

24.31+24.63+25.09+26.87+24.21+27.58+24.29+25.63+23.66+25.23=251.5
251.5/10 = 25.15

Candidates may round up or round down the final answer and so 25.2 or 25 are also acceptable as the correct mean. Candidates who round up incorrectly (e.g. 26) can gain the calculations mark only.

N.B. Candidates do not receive credit if they have shown the formula or method used to calculate a mean score but have not actually calculated the mean score using the data from this scenario.

| Marks | AO2 |
|-------|-----|
| 2 | • Correct mean value given and appropriate calculations. |
| 1 | • Correct mean value given, but no calculations are evident.<br>OR<br>• Correct calculations given, but final mean given is incorrect. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b) Suggest an appropriate operationalised null hypothesis for this research.    [2]

| Exemplar answers: |
| --- |
| <ul><li>Any difference in the time taken in seconds to complete a 200m race with a crowd and without a crowd will be due to chance factors. (2 marks)</li><li>There will be no significant difference in the time taken (seconds) to complete a 200m race with a crowd and without a crowd. (2 marks)</li><li>There will be no difference in the time taken to run 200m in front of a crowd and not in front of a crowd. (1 mark)</li><li>Any other appropriate content.</li></ul> |

| Marks | AO2 |
| --- | --- |
| 2 | • Appropriate null hypothesis, with clearly operationalised IV and DV. |
| 1 | • Appropriate, yet basic null hypothesis, possibly with only the IV or DV clearly operationalised. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(c) Explain **one** confounding variable that could have influenced the results of this research.    [2]

| Credit could be given for: |
| --- |
| Confounding variables, such as:<ul><li>Some athletes may not want to try to be as fast as they can for risk of injury as the race set up by the researcher isn't counting towards anything apart from the research.</li><li>Different athletes may respond differently to the crowd; some may find a crowd motivating, others may find it a distraction.</li><li>The athletes were matched based on their personal best times from the previous season, some participants may have had more effective training regimes since then.</li></ul><br>• Any other appropriate content. |

| Marks | AO2 |
| --- | --- |
| 2 | • Appropriate confounding variable explained and linked to this research. |
| 1 | • Appropriate confounding variable explained, however it is not linked to this research. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(d)    Identify the level of measurement of the data collected in this research.    [1]

| Marks | AO2 |
|---|---|
| 1 | • Ratio |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(e)    The sports psychologist found that, after analysing the data with a Wilcoxon test, the observed (calculated value) was 8.  The critical value for p=0.05 (N=10 and a two tailed test) is also 8.

(i)    State whether the sports psychologist should accept or reject the null hypothesis.    [1]

| Marks | AO2 |
|---|---|
| 1 | • Reject.<br>• Reject the null hypothesis. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(ii)    Explain why the sports psychologist should accept or reject the null hypothesis.    [2]

| Credit could be given for: |
|---|
| Exemplar answers: |
| • As the observed value (8) is equal to the critical value (8) then the result is significant at 0.05 and therefore the null hypothesis can be rejected, and the experimental hypothesis accepted. (2 marks)<br><br>• As the calculated value is equal to the critical value the null hypothesis can be rejected. (1 mark)<br><br>• Any other appropriate content. |

| Marks | AO2 |
|---|---|
| 2 | • Appropriate explanation with a link to the research. |
| 1 | • Appropriate explanation not linked to this research. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(f)     Explain why the ethical issue of 'risk of stress, anxiety, humiliation or pain' may arise in this research and explain how it could be managed.          [2+2]

Credit could be given for:

One mark for explaining the ethical issue.
One mark for linking the ethical issue to the novel scenario.
One mark for explaining an appropriate way of managing the risk posed by ethical issue identified.
One mark for linking the appropriate way of managing the risk posed by ethical issue to the novel scenario.

Example answer:

Some of the athletes might feel humiliated if the time they take to run the 200m race is a lot more than the time taken by their partner that they were matched with. To manage this the sports psychologist could keep the timings from all athletes' races confidential and if she published her research, she could use mean scores for the time taken to run with or without crowds, so no individual timings would be published. (4 marks)

•     Any other appropriate content.

10. A worker at a local dog rescue shelter was asked by her boss to investigate the best way to raise money for the shelter. She decided to post a questionnaire on-line in order to find out which strategies for fund raising were the most appealing to people who visit the dog rescue shelter's website.

In one of the questions she asked the participants:

---

12. Please tick the fundraising event you are most likely to take part in:

☐ Raffle

☐ Charity Fete

☐ Sponsored Dog Walk

---

She found that:
- 15 participants would most likely take part in a Raffle;
- 10 participants would mostly take part in a Charity Fete;
- 20 participants would mostly likely take part a Sponsored Dog Walk.

(a) Explain whether the data collected from question 12 above, would produce quantitative or qualitative data. [2]

---

Credit could be given for:

Exemplar answers:

- Question 12 would produce quantitative data as the data can only be put into categories, raffle, fete, dog walk, and the question is closed. (2 marks)

- Question 12 would produce quantitative data because it offers only a limited range of choices, it is not an open question. (1 mark)

- Any other appropriate content.

| Marks | AO2 |
|---|---|
| 2 | • Appropriate explanation with a link to the research. |
| 1 | • Appropriate explanation not linked to this research. OR<br>• Brief identification of an appropriate explanation that has been linked to this research. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |

(b)     Explain **one** strength of the worker conducting this research on-line.     [2]
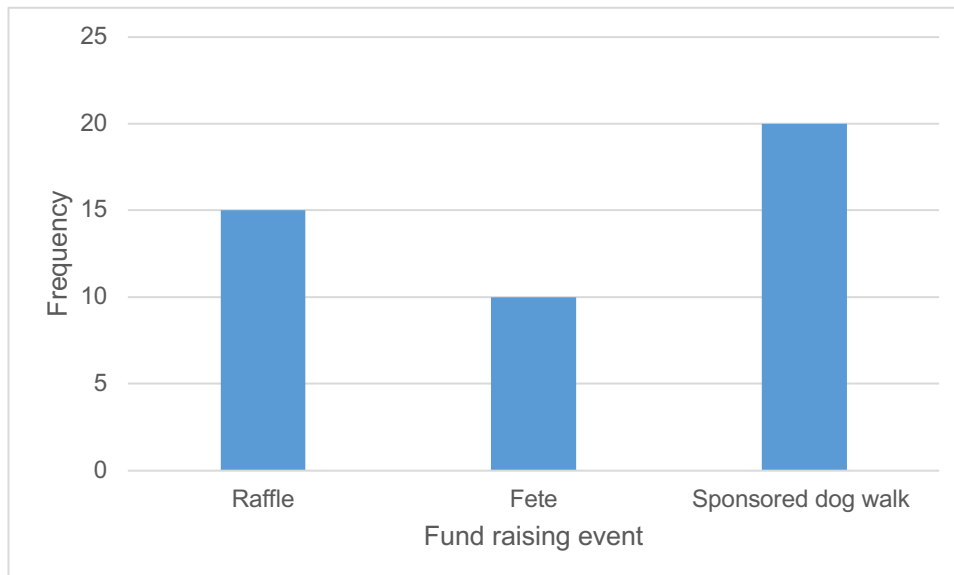
| Credit could be given for: |
| --- |
| • Access to a potentially more geographically diverse sample. <br> • More economical and quicker to collate responses from participants than traditional methods. <br> • Use of software that helps analyse and display results. <br> • Any other appropriate content. |

| Marks | AO2 |
| --- | --- |
| 2 | • Appropriate strength linked to this research. |
| 1 | • Appropriate strength, but not linked to this research. |
| 0 | • Inappropriate answer given. <br> • No response attempted. |

(c)     Complete the following bar chart by:

(i)      Accurately plotting the data.                                                    [1]

(ii)     Labelling both of the axes.                                                    [1]

Credit could be given for:



**AO2**
1 mark for accurately plotting all three categories.
1 mark for labelling both axes.

(d)  Explain **two** ways in which you could improve this research.        [2+2]

Credit could be given for:

Exemplar answers:
- Conduct the research face to face using a semi-structured interview, so the participants can ask for clarification of the fund-raising options if required e.g. they may not know what a 'fete' is. Also, I would conduct the research on the high street and not just ask people visiting the website as the sample on the high street might be more varied than the type of people who visited the dog shelter website. (4 marks)

- I would conduct the research face to face to make it more valid. I would also use an interview rather than a questionnaire. (2 marks)

- Any other appropriate content.

| Marks | AO3 |
|-------|-----|
| 2 | • Reasonable explanation of why the suggestion would improve the research. |
| 1 | • Basic explanation of why the suggestions would improve the research. |
| 0 | • Inappropriate answer given.<br>• No response attempted. |