A LEVEL

PSYCHOLOGY

COMPONENT 2
PSYCHOLOGY:
Investigating Behaviour

GENERAL INSTRUCTIONS ON MARKING

- Every candidate's script must be treated in the same way throughout the whole marking session.

- The mark scheme should be applied positively. It is not required for an answer to be 'perfect' to gain full marks. Candidates should be rewarded for what they have included and not penalised for leaving things out. The process is different from marking as a teacher (i.e. it is about rewarding rather than guiding).

- Original thoughts and unusual exemplars can be credited; however, do check for accuracy of unusual answers.

- The full range of marks should be used. If the answer shows the features of the top band with no significant issues, full marks can be given. Similarly, an answer which does not answer the question should be given zero marks.

- The subjective nature of psychology inevitably requires examiners to use their professional judgment. Care should be taken however, not to decide on value of the answer due to personal opinions. If the material is used appropriately to answer the question then credit should be given in accordance with the skills demonstrated and indicated in the various bands.

- Crossed out work should be marked unless the candidate has made another attempt at answering the question.

- Any rubric errors should work to the candidate's advantage i.e. mark all answers completed and credit the highest scoring valid combination.

- If at any time during the marking the examiner has a concern regarding content of an answer, the Team Leader or Principal Examiner should be consulted.

Indicative content

It is essential to acknowledge the subjective nature of psychology and therefore there are not always specific answers that can be included in the mark scheme. The indicative content is simply advice on each specific question, outlining some possibilities; it is not prescriptive or hierarchical and candidates are not expected to mention all the materials mentioned. They are also able to refer to other studies, theories, issues etc. which would be credited based on skills shown in accordance with the guidance in the grids.

Which mark within a band?

Having decided on the overall band that is appropriate for the response given, the examiner should start with the top mark in the band. If there are aspects of the answer which may not be fully representative of the band, the mark given may be lower in the band.

Quality of written communication

This issue should have a bearing only if the quality of written communication is inconsistent with the descriptor for the band in which the answer falls decided on the psychological content. In this situation, examiners may decide not to award the higher mark within the band. Any illegible text should be referred to the Subject Officer.

Annotation to be used

✓ – correct material

✓+ – correct material developed

x – incorrect material

? – unclear

EV – evaluation

GEV – generic evaluation

EX – example used is appropriate

NREL – does not answer question (i.e. not relevant)

SECTION A - Principles of Research

1. Describe how you would calculate a mean score of a set of data. [2]

This question is focused on demonstrating knowledge of scientific ideas.	
Credit **could** be given for: • Totalling the sum of the data and dividing by number of items • An example of data and the mean calculated • Formula $\overline{x} = \frac{\Sigma x}{n}$ • Any other appropriate description	
Marks	**AO1**
2	• Complete description given which would allow the mean to be calculated correctly
1	• Formula given only
0	• Key element missing which would not allow mean to be calculated correctly • Inappropriate answer given • No response attempted

2. Analyse **two** weaknesses of conducting psychological research in the field. [6]

This question is mainly focused on analysing, interpreting and evaluating scientific information, ideas and evidence in relation to making judgements and reaching conclusions.	
Credit **could** be given for: • Judgement on the control of variables • Difficult to ensure reliability if needing to repeat the research • Validity of the work may be compromised by extraneous variables • Analysis of ethical issues (e.g. lack of informed consent by unaware participants) • Any other appropriate weakness	
Marks	**AO3**
5 - 6	• Two weaknesses of research in the field are clearly identified • Thorough analysis of both weaknesses
3 - 4	• Two weaknesses of research in the field are identified and reasonably analysed OR • Two weaknesses of research in the field are identified, however only one is thoroughly analysed
1 - 2	• Two weaknesses of research in the field are identified, but not analysed OR • One weakness of research in the field is identified and thoroughly analysed
0	• Inappropriate answer given • No response attempted

3. Assess whether an independent groups design or a repeated measures design is best for ensuring valid results in an experiment. [6]

This question is focused on interpreting and evaluating scientific information, ideas and evidence, including in relation to issues, to make judgements, reach conclusions, develop and refine practical design.

Credit **could** be given for:

- Independent groups design:
  - Strength e.g. reduced rehearsal allows genuine response and therefore higher validity
  - Weakness e.g. individual differences can reduce reliability therefore reducing validity
- Repeated measures design:
  - Strength e.g. consistency of the characteristics between the two conditions of the experiment therefore increasing validity in strength of the IV
  - Weakness e.g. knowledge of the experiment in second condition can reduce validity
- Possible conclusion: both have equal validity and choice of design is dependent on the nature of the experiment

- Any other appropriate assessment

Marks	AO3
5 - 6	• The interpretation and evaluation of both designs is thorough and coherent • Logical interpretations are presented • There is an effective judgement shown
3 - 4	• There is a sound interpretation and evaluation of both designs which may be flawed in parts • Interpretation may be simple but makes a valid judgement
1 - 2	• One-sided interpretation and evaluation of both designs OR • The assessment of one design is thorough and coherent • There is no overall judgement
0	• Inappropriate assessment made • No response attempted

4. Describe the main features of a case study. [4]

This question is focused on demonstrating knowledge of scientific ideas.	
Credit **could** be given for: • Longitudinal study • In-depth investigation of a phenomenon • Descriptive, exploratory or explanatory analysis of a person, group or event • Holistic study by one or more methodologies • Empirical inquiry that investigates a phenomenon within its real-life contex • Any other appropriate feature **NB** There is no need for an example but if used to highlight a feature, credit can be given.	
Marks	**AO1**
3 - 4	• Thorough description of a case study given • Good use of appropriate terminology • There is depth to the material used
1 - 2	• Basic description of a case study OR • No more than two features identified • Some terminology is evident • May be list like
0	• Example of a case study given but with no reference to the features • Inappropriate answer given • No response attempted

5. With reference to Milgram's (1963) research *Behavioural study of Obedience* discuss the use of the experimental method in investigating social behaviour. [12]

This question is focused on demonstrating knowledge and understanding of scientific processes, techniques and procedures.

Credit **could** be given for:

- Use of controlled environment (in a laboratory)
- Scripted responses by learner to ensure reliability
- Strict sampling frame to reduce individual differences (i.e. men 20 – 50 years old)
- Use of prompts (e.g. 'you have no other choice, you *must* go on)

- Any other appropriate evidence

NB Credit only given to details from the original study.

Marks	AO1
5 - 6	• Accurate and detailed examples chosen from Milgram's research • There is range and depth of evidence • Excellent use of appropriate terminology
3 - 4	• There is range or depth of evidence from Milgram's research • There may be some inaccuracies • Good use of appropriate terminology
1 - 2	• Limited evidence given from Milgram's research • Inaccuracies throughout • Little use of terminology
0	• Inappropriate material used • No attempt made to give evidence

This question is focused on analysing, interpreting and evaluating scientific information, ideas and evidence including in relation to issues to develop and refine practical procedures.

Credit **could** be given for:

- Impact of tight control on the behaviour of the participants (e.g. demand characteristics) thereby reducing the ecological validity
- Internal validity is improved by being able to reduce confounding variables thereby ensuring that the data gained can be applied in real life settings
- Interpretation of the ethics of purposefully creating stressful situations

- Any other appropriate discussion

Marks	AO3
5 - 6	• Thorough and articulate discussion • There is depth and range to the issues raised • The argument is balanced • An appropriate conclusion is made
3 - 4	• A good discussion • There is depth and range to the issues raised (not necessarily equal) • Argument may be one-sided • A conclusion is made
1 - 2	• Basic and superficial discussion • There is depth or range only to the issues raised • There is no conclusion
0	• Inappropriate discussion • No attempt made to discuss

SECTION B – Personal Investigations

You should *answer* **all** *the questions* in this section with reference to the investigations carried out in your study of psychology.

INVESTIGATION ONE: Correlational research on the relationship between age and reaction times

6. (a)(i) State the alternative hypothesis for your correlational investigation. [3]

This question is focused on demonstrating knowledge of scientific ideas.	
Exemplar hypotheses: • As age (years) increases in the participant, there will be a reduction in their response times (seconds) in a recognition task • There will be a relationship between age and reaction times **NB** We cannot know if candidates have carried out the investigation – the marks given must be based on the response to the questions only and allocated in accordance with the criteria indicated in the marking bands below.	
Marks	**AO1**
3	• Full alternative hypothesis (which is appropriate for this investigation) given with both variables clearly operationalised
2	• Full alternative hypothesis (which is appropriate for this investigation) given with only one variable clearly operationalised
1	• Basic alternative hypothesis (which is appropriate for this investigation) given but neither variable is clearly operationalised
0	• Experimental or null hypothesis given • Inappropriate answer given • No response attempted

(ii) Explain whether this alternative hypothesis for your correlational investigation was directional or non-directional. [2]

This question is focused on applying knowledge and understanding of scientific ideas in a practical context when handling quantitative data.	
Exemplar explanation: As there is a clearly identified direction in which the relationship will work between the two co-variables (age in years and response times in seconds) i.e. the use of the word 'reduction' this must be a directional hypothesis.	
Marks	**AO2**
2	• Full explanation of direction of alternative hypothesis used in their correlational investigation
1	• Statement of direction of alternative hypothesis used in their correlational investigation
0	• Inappropriate answer given • No response attempted

(b) (i) Describe the sampling method that you used. [2]

This question is focused on demonstrating knowledge and understanding of scientific processes, techniques and procedures.	
Credit **could** be given for: • Opportunity sampling – using those available in a named location (that is appropriate to hypothesis given above) • Random sampling – placing the names of all those able to participate in a randomiser computer programme to generate the required number • Stratified sampling – ensuring that there is a representation of all ages in proportion to percentages in the population • Any other appropriate sampling method	
Marks	**AO1**
2	• Detailed description of sampling method • Contextualised to specific investigation
1	• Sampling method described generically • Description may be muddled
0	• Inappropriate answer given • No response attempted

(ii) Explain why this sampling method was chosen. [3]

This question is focused on applying knowledge and understanding of scientific processes, techniques and procedures in a practical context when handling quantitative data.
This response needs to use knowledge and understanding of the strengths of their sampling method or the weakness of other sampling methods to explain why their choice was most appropriate for their practical personal investigation. Exemplar answer: Due to the investigation considering effect of age on reaction times I thought it best to ensure a representation of every age group from the population. I considered using self-selecting sampling by placing adverts in different locations (e.g. old people's homes, schools, workplaces etc.) but I could not be sure to receive an equal response from each. I decided it was necessary to use a stratified sampling method and although this was time consuming it ensured that the results I achieved were valid in the context of my hypothesis.

Marks	AO2
3	• Thorough explanation given in relation to a strength of method used and / or weakness of other methods • There is a logical application of the sampling method used for the purpose of their investigation
2	• Reasonable explanation given in relation to the strength of method used and / or weakness of other methods • Lacks some application of the sampling method used for the purpose of their investigation
1	• Basic explanation given in relation to a strength of method used or a weakness of other methods only • No application to the purpose of their investigation (i.e. a generic reason)
0	• Inappropriate answer given • No response attempted

(c) Suggest **two** ways your investigation could have been improved. [6]

This question is focused on analysing, interpreting and evaluating scientific information, ideas and evidence in relation to developing and refining practical design and procedures.

Credit **could** be given for:

- Changes to sampling method (e.g. to use a quicker and less complicated method)
- Improving the ethical aspects (e.g. ensuring ethical guidelines were more strictly adhered to)
- Changing the methodology for gathering the data to another with greater validity
- Rewording the instructions given to participants to reduce demand characteristics and improve reliability
- Collect different types of data (e.g. quantitative rather than qualitative)
- Carry out at a different location / time

- Any other appropriate suggestion

NB The two ways can be similar in nature as long as there is a distinct analysis of the effect of the change.

Marks	AO3
5 - 6	• Two ways of improving the investigation are suggested • Thorough analysis of why these suggestions would improve the investigation • The answer is logical • Good use of appropriate terminology
3 - 4	• Two ways of improving the investigation are suggested • Reasonable analysis of why these suggestions would improve the investigation OR • There may be only one way of improving the investigation identified, however analysis is detailed • The answer is mostly logical • Some appropriate terminology is used
1 - 2	• Two ways of improving the investigation are suggested but not analysed OR • Only one way of improving the investigation is identified and analysed in a basic way • Answer lacks logic • Little use of appropriate terminology
0	• Inappropriate answer given • No response attempted

(d) Another student carried out a correlational research on the relationship between age and reaction times. Their results are shown in the table below. With reference to their raw data only, explain how you could estimate the relationship between age and reaction times in this research (you do not need to plot a scatter diagram).

Participant number	Age	Reaction time (seconds)
1	73	10
2	18	5
3	55	7
4	10	4
5	24	5

[3]

This question is focused on applying knowledge and understanding of scientific processes, techniques and procedures in a practical context when handling quantitative data.	
This response needs to demonstrate that an initial inference can be made from looking at the raw data. There is no need for reference to inferential statistics here and will not be credited. Exemplar answer: By placing the ages in a chronological order (from lowest to highest – 10, 18, 24, 55, 73) and then looking at the corresponding reaction times (4, 5, 5, 7, 10) an inference that should be made is that there is indeed a correlation between age and reaction times. As both figures mostly go in the same direction (with the exception of age 24 showing the same result as age 18) this is a positive correlation. **NB** Whilst there is no need for a scatter diagram, credit will not be taken away for its inclusion by the candidate.	
Marks	**AO2**
3	• Thorough explanation of the findings that could be made • There is a logical application of the raw data used
2	• Reasonable explanation of the findings that could be made • Lacks some application of the raw data
1	• Basic explanation given of the findings that could be made • No application of the raw data
0	• Inappropriate answer given • No response attempted

INVESTIGATION TWO: Observation of gender difference in food choices

7. With reference to details from your own investigation, describe how you ensured that the observation you carried out was ethical. [12]

This question is focused on applying knowledge and understanding of scientific ideas, processes, techniques and procedures in theoretical and practical contexts when handling mainly quantitative data.

Credit **could** be given for:

- Principles of ethics applied to own practical work: confidentiality – using participant numbers not names; consent – use of presumptive consent, observation of behaviour in a public environment (e.g. school canteen, local café)
- Consideration of working with vulnerable individuals (e.g. children) – gain consent from the educational establishment
- Adherence to BPS guidelines: invasion of privacy, avoiding embarrassment
- Awareness of cultural and social norms
- Decisions on appropriate data to collect (qualitative e.g. speech when choosing; quantitative e.g. number of food items chosen, amount of money spent)

- Any other appropriate description

NB We cannot know if candidates have carried out the investigation – the marks given must be based on the responses to the questions only and allocated in accordance with the criteria indicated in the marking bands below.

Marks	AO2
9 - 12	• Description of the ways of dealing with ethical issues used in their observation is well detailed • Application of the material used is well judged • There is depth and range to material used • Effective use of terminology
5 - 8	• Description of the ways of dealing with ethical issues used in their observation is detailed • Application of the material used is appropriate • There is depth and / or range only in material used • Good use of appropriate terminology
1 - 4	• Description of the ways of dealing with ethical issues used in their observation is superficial and / or generic • Application of the material is inappropriate or omitted • Answer does not move beyond description of ethics • There is little use of appropriate terminology
0	• Inappropriate answer given • No response attempted

SECTION C – Application of research methods to a novel scenario

8. A psychologist was asked to investigate the effects of noise on the stress levels of pupils at a local school. She measured the cortisol levels in the saliva of ten children after they had been carrying out a task for an hour. Cortisol is released when an individual interprets a situation as being stressful. The task was familiar to, and identical for, all the pupils but there were two conditions of noise levels (low level and high level). On day one the pupils completed the task with music played quietly whereas on day two the same music was played loudly as they carried out the same task.

The results are shown in *Table 1* below:

Table 1: Summary table of raw data, mean and standard deviation

Participant (f=female, m=male)	**Level of cortisol in saliva samples after one hour on the task (nmol/L)**	
	Low levels of noise	**High levels of noise**
1f	20	13
2f	6	40
3f	1	12
4f	9	3
5f	0	15
6f	13	7
1m	4	22
2m	3	19
3m	2	11
4m	2	8
Mean	6	15
Standard Deviation	6.32	10.14

(a) (i) Calculate the median scores for the 'low levels of noise' condition and the 'high levels of noise' condition. [2]

This question is focused on applying knowledge and understanding of scientific processes, techniques and procedures in a practical context when handling quantitative data.	
Credit given for: Median scores: Low levels of noise - 3.5 High levels of noise - 12.5	
Marks	**AO2**
2	• Both median scores are fully accurate
1	• One median score is fully accurate OR • Both median scores given without decimal point (i.e. 3 and 12)
0	• Inappropriate answer given • No response attempted

(ii) Calculate the modal scores for the 'low levels of noise' condition and the 'high levels of noise' condition. [2]

This question is focused on applying knowledge and understanding of scientific processes, techniques and procedures in a practical context when handling quantitative data.	
Credit given for: Modal scores: Low levels of noise - 2 High levels of noise - no mode (do not accept 0 or zero)	
Marks	**AO2**
2	• Both modal scores are fully accurate
1	• One modal score is fully accurate
0	• Inappropriate answer given • No response attempted

(iii) Discuss which measure of central tendency is the most appropriate for this set of data. [6]

This question is focused on analysing, interpreting and evaluating scientific information, ideas and evidence in relation to making judgements and reaching conclusions.

Credit **could** be given for:

- Mean
  - Advantages: it is very sensitive and extracts most information from the scores; the data in this research is ratio which suits the mean; data is not likely to be skewed which favours the mean
  - Disadvantages: the sensitivity, especially if scores are widespread (as in the low levels of noise condition)
- Median
  - Advantages: not affected by extreme scores (as seen in the low levels of noise condition)
  - Disadvantages: not as sensitive as the mean as not all raw scores are used in its calculation
- Mode
  - Advantages: useful when the data is discrete (not an issue with this set of data)
  - Disadvantages: not useful with small amount of data (e.g. there is no mode for the high levels of noise condition)

- Conclusion: Most likely to favour the mean but an appropriate argument for the others can be credited

- Any other appropriate discussion and conclusion

Marks	AO3
5 - 6	• Thorough discussion focusing on the advantages and disadvantages of all three measures • Clear links made to this set of data • An appropriate and logical conclusion is reached based on the analysis and interpretation of the material • Excellent terminology is used
3 - 4	• Good discussion focusing on advantages and / or disadvantages of some measures • Some links made to this set of data • Conclusion reached may not be logical based on the analysis and interpretation of the material • Good use of terminology
1 - 2	• Only one measure is discussed but done thoroughly OR • Basic discussion made of some measures • No link to this set of data • No conclusion made • Little use of terminology
0	• Measure of central tendency named only • Inappropriate answer given • No response attempted

(b) Identify the measure of dispersion used and describe **one** advantage of using this measure of dispersion. [3]

This question is focused mainly on demonstrating knowledge of scientific processes, techniques and procedures.
Credit given for: Identification: • Standard Deviation Advantage could include: • Better representation of the data than the mean alone • Includes all data in its calculation • Gives weightage to the positive and negative deviation of the data from the mean • Any other appropriate advantage

Marks	AO1
3	• Correct identification plus a full description of an appropriate advantage
2	• Correct identification plus a basic description of an appropriate advantage OR • A full description of an appropriate advantage only
1	• Correct identification only
0	• Inappropriate answer given • No response attempted

(c) Identify and justify which inferential statistical test should be used to analyse this data [4]

This question is focused on applying knowledge and understanding of scientific ideas in a practical context when handling quantitative data.
Credit given for: • Identification (1 mark) Wilcoxon matched pairs signed ranks test (do not credit any other test with Wilcoxon name) • Justification: 1 mark for each (max. 3 marks) - Data at ordinal level - Testing for a difference - Scores obtained from the same participants (in repeated measures of matched pairs)

Marks	AO2
0	• Inappropriate answer given • No response attempted

The psychologist proposed an experimental hypothesis: 'Levels of cortisol will be lower after completing a task with low levels of noise than when completing a task with high levels of noise'. The results are shown in *Table 2* below.

Table 2: Extract of critical values of T ($p \leq 0.05$)

N	One-tailed test	Two-tailed test
8	5	3
9	8	5
10	11	8
11	13	10
12	17	13

(d) From *Table 2*, identify an appropriate critical (table) value for this research and state why you chose this critical value. [2]

This question is focused on applying knowledge and understanding of scientific processes, techniques and procedures in a practical context when handling quantitative data.	
Credit given for: Critical value: 11 Justification: N=10, one tailed test	
Marks	**AO2**
2	• Critical value is identified with full justification
1	• Critical value is identified and partial justification
0	• Inappropriate answer given • No response attempted

(e) The value of T was observed (calculated) to be 20. Justify whether the psychologist should accept or reject her experimental hypothesis. [3]

This question is focused on applying knowledge and understanding of scientific ideas in a practical context when handling quantitative data.	
Credit **could** be given for: Exemplar answer: 'The researcher should reject her experimental hypothesis as the observed value (20) was more than the critical value (11) meaning that the result was not statistically significant at $p \leq 0.05$'	
Marks	**AO2**
3	• Rejection of experimental hypothesis identified with full justification
2	• Rejection of experimental hypothesis identified with partial justification
1	• Rejection of experimental hypothesis identified with no justification
0	• Inappropriate answer given • No response attempted

(f) Explain what is meant by $p \leq 0.05$ in this research. [2]

This question is focused on applying knowledge and understanding of scientific ideas in a practical context when handling quantitative data.	
Exemplar explanation: '$p \leq 0.05$ means there is a less than 5% chance that the results are due to stress levels being affected by the difference in noise levels.'	
Marks	**AO2**
2	• Explanation is appropriate and applied to the research
1	• Explanation is appropriate but not applied to the research
0	• Inappropriate answer given • No response attempted

9. It has been suggested that petting an animal can help improve mood and health of patients recovering in hospital. Suggest how a psychologist could investigate this **using an experiment**. In your answer you should include: [15]

- the operationalisation of the independent variable (IV) and dependent variable (DV)
- details of the experimental design and sample (including sampling)
- identification of **two** possible confounding variables and how you would deal with these.

This question is focused on applying knowledge and understanding of scientific ideas, processes, techniques and procedures in theoretical and practical contexts when handling quantitative data.

Credit **could** be given for:
Key elements:

- Appropriately operationalised independent and dependent variables
- Appropriate identification and justification of experimental design used; full description of sample used
- Two confounding variables are identified with appropriate explanation of how these confounding variables would be dealt with
- Ethical principles
- Any other appropriate material

NB Questionnaires and observations can be used within an experiment and therefore creditable if made clear; however, any data collected must be quantitative in line with the experimental methodology.

Marks	AO2
13 - 15	• Suggestion includes all of the key elements and is thoroughly detailed • Material used is well applied to the scenario • Effective use of terminology • The structure is logical and coherent • It would be easy to carry out the investigation
9 - 12	• Suggestion includes the all the key elements and is reasonably detailed • Material used is reasonably applied to the scenario • Good use of terminology • The structure is logical • It would be easy to carry out the investigation
5 - 8	• Suggestion may be lacking a key element, however remaining discussion is reasonably detailed • Material used shows some application to the scenario • There is some use of appropriate terminology • There is a reasonable structure • Not always clear how to carry out the investigation
1 - 4	• Suggestion may be lacking more than one key detail and remaining discussion is basic • Material used is superficially applied to the scenario • Very little use of appropriate terminology • Answer lacks clarity and structure so carrying out the investigation would be difficult
0	• Inappropriate answer given (e.g. non-experimental method used) • No response attempted