Surname	StemUp Model Solution	Centre Number	Candidate Number
First name(s)			2

GCE A LEVEL

S23-1290U40-1

1290U40-1

MONDAY, 5 JUNE 2023 – AFTERNOON

PSYCHOLOGY – A2 unit 4
Applied Research Methods

1 hour 30 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**14**	
2.	**16**	
3.	**10**	
4.	**20**	
Total	**60**	

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ADDITIONAL MATERIALS

You may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. Additional space is provided for some questions within the booklet (if required). If further space is required for any question, you should use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

Assessment will take into account the quality of written communication used in your answers.

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SECTION A – Personal investigations

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

INVESTIGATION ONE:

A content analysis of anti-social behaviour in the media.

1. (a) Explain how you collected the data for your content analysis. [4]

I carried out a content analysis of anti-social behaviour in 10 episodes of the soap opera EastEnders, each about 30 minutes long, broadcast over two weeks. First I made a coding system (behavioural checklist) of operationalised categories of anti-social behaviour: physical aggression (hitting, kicking, pushing), verbal aggression (swearing, shouting insults, threats), vandalism/damage to property, and theft.

I watched each episode and every time a character showed one of the behaviours I put a tally in that category on my checklist, rewinding if needed. This turned the qualitative content of the programmes into quantitative data (frequency counts) for each category. At the end I added up the tallies for each category and episode, so I could see which type of anti-social behaviour was shown most often (verbal aggression was the most frequent).

(b) (i) Explain **one** way the validity of your content analysis could be assessed. [2]

I could assess content validity by giving my coding system of anti-social behaviour categories to an expert, e.g. my psychology teacher, who would scrutinise it to check that the categories (aggression, swearing, vandalism, theft) fully and fairly measure anti-social behaviour in EastEnders, the aim of my content analysis.

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(ii) Explain **one** way the reliability of your content analysis could be assessed. [2]

I could assess inter-rater reliability by asking a second researcher to watch the same 10 EastEnders episodes and independently tally anti-social behaviour using exactly the same coding system. Our tallies for each category would be correlated; if there was 80% or more agreement (+0.8) the content analysis would be reliable.

(c) Evaluate **one** strength and **one** weakness of using a content analysis when investigating anti-social behaviour in the media. [3 + 3]

Strength: content analysis condenses qualitative media content into quantitative data. By tallying how many times characters in EastEnders swore, hit someone or damaged property, I produced frequency counts which could be analysed and displayed in a bar chart, so trends and patterns in the types of anti-social behaviour shown in the media could be identified and compared objectively.

Weakness: there is a risk of researcher bias. As I chose the media myself, I may have picked a programme (a soap opera known for arguments and fights) or episodes that would support my hypothesis that the media shows a lot of anti-social behaviour, and my own interpretation of what counts as e.g. 'verbal aggression' may be subjective. This lowers the validity and generalisability of the findings, as other TV programmes or media such as films or social media may show different amounts of anti-social behaviour.

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INVESTIGATION TWO:

A questionnaire on pet ownership and stress.

2. (a) Using an example from your questionnaire, identify and explain what type of data you collected. [3]

I collected quantitative data, which is numerical data that can be statistically analysed. For example, one question was 'On a scale of 1 (not at all stressed) to 10 (extremely stressed), how stressed have you felt in the last week?'. This produced ordinal data, as the stress ratings can be put in rank order but the intervals between each point on the scale are not necessarily equal.

(b) Describe **one** ethical issue you faced during your questionnaire study and explain how you dealt with it. [4]

One ethical issue was protection from psychological harm. My questionnaire asked participants to rate how stressed they felt and to think about stressful events in their lives, which could have caused them anxiety or distress, especially if they had recently lost a pet.

I dealt with this by telling participants in the briefing and consent form that they did not have to answer any question that upset them and could withdraw at any time. At the end I fully debriefed every participant, explained the aim of the study on pet ownership and stress, and gave them contact details for the school counsellor and support services in case they needed help with any stress.

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(c) (i) Identify **one** descriptive statistic you used to summarise the results of your questionnaire study. [1]

The median.

(ii) Justify why the descriptive statistic identified in (c)(i) was appropriate for your questionnaire study. [2]

My stress ratings (1 to 10) were ordinal data, so the intervals are not equal and the mean would be inappropriate. The median was also not distorted by one extreme score of 10 in the non-pet owner group, giving a more representative average stress score.

(d) Justify the level of significance used when analysing the results of your questionnaire. [2]

I used $p \leq 0.05$ because it is the standard level in psychology: it is not too lenient (Type 1 error) or too stringent (Type 2 error). It meant there was only a 5% probability that the difference in stress scores between pet owners and non-pet owners was due to chance.

(e) With reference to the inferential statistic you used, justify which hypothesis was accepted and which hypothesis was rejected. [4]

I used a Mann-Whitney U test (independent groups, ordinal data, test of difference). My hypothesis was directional, so with 10 pet owners and 10 non-pet owners the critical value for a one-tailed test at $p \leq 0.05$ was $U = 27$. My observed value was $U = 19$, which is less than the critical value, so the result was significant. I therefore accepted my alternative hypothesis that pet owners report lower stress scores than non-pet owners, and rejected the null hypothesis that there is no difference in stress scores between them.

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SECTION B – Application of research methods to novel scenarios

Answer **all** questions.

3. A woman, known as M.T., had an accident and suffered a brain injury which resulted in her suffering from memory and speech problems. Whilst receiving treatment for her injuries, a researcher conducted a case study on M.T. One method used to investigate the extent of M.T.'s brain injury was a brain scan.

(a) (i) Identify **one** type of brain scan. [1]

Magnetic Resonance Imaging (MRI) scan.

(ii) Evaluate **one** strength and **one** weakness of using the brain scan you identified in (a)(i). [2 + 2]

Strength: an MRI scan gives very detailed, high resolution images of the soft tissue of the brain, more detailed than a CAT scan, so the researcher could see exactly which areas of M.T.'s brain were damaged in the accident, e.g. the hippocampus (memory) or Broca's area (speech). It also uses magnetic fields rather than radiation, so M.T. can safely be scanned several times during her treatment to track her recovery.

Weakness: MRI scans take a long time and can be uncomfortable, as M.T. must lie completely still in a noisy, enclosed scanner, which may be distressing for a patient with a recent brain injury. Also, a structural MRI only shows the structure of the brain, not its activity, so it cannot show how well damaged areas are functioning when she tries to remember or speak.

Additional space for question **3**(a)(ii) only:

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(b) Justify the use of a case study as the methodology of this research. [2]

A case study is appropriate because M.T.'s brain injury is a rare, unique case that could not be created ethically in an experiment. It allows an in-depth, detailed investigation of how the accident affected her memory and speech, using a variety of methods (brain scans, interviews, observations, memory tests) to give both qualitative and quantitative data, and her progress can be followed over time.

(c) Apart from a brain scan, briefly explain how **one** other methodology could be used to investigate the effect of M.T.'s brain injury. [3]

A laboratory experiment (memory test) could be used. In a quiet, controlled room M.T. could be shown 7 everyday objects for 30 seconds and then asked to recall as many as possible after a 15 second delay. Her recall score (out of 7) could be compared with the average score of healthy women of the same age to measure the effect of the brain injury on her short term memory. The test could be repeated with a different set of 7 objects, using standardised instructions, three months after treatment to assess whether her memory has improved. Her speech could also be tested by asking her to name 20 pictured objects and counting how many she named correctly, giving quantitative data on her speech problems.

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4. A psychologist conducted an experiment on whether familiarity with the teacher affects students' obedience within a classroom. The psychologist used an opportunity sample of 10 male and 20 female students from one GCSE class. In their Monday morning lesson, their usual teacher taught the lesson. On Wednesday afternoon, a teacher not known to the students taught the lesson. Both lessons were secretly filmed and independent reviewers noted down how many students obeyed (completed the task) or disobeyed (did not complete the task) the teacher. A table of results can be seen below.

	Number of students	
	Obeyed	**Disobeyed**
Familiar teacher	22	8
Unfamiliar teacher	17	13

(a) (i) Fully explain how the independent variable was operationalised in this research. [2]

The IV (familiarity with the teacher) was operationalised by having the lesson taught either by the students' usual teacher (familiar, Monday morning) or by a teacher not known to the students (unfamiliar, Wednesday afternoon).

(ii) Fully explain how the dependent variable was operationalised in this research. [2]

The DV (obedience) was operationalised by independent reviewers watching the secret films and counting how many students obeyed (completed the task) or disobeyed (did not complete the task) the familiar and unfamiliar teacher.

(b) Explain how **one** confounding variable could affect this research. [2]

Time of day: the familiar teacher taught on Monday morning and the unfamiliar teacher on Wednesday afternoon, when students may be more tired. Fewer may have completed the task due to tiredness, not the IV, lowering internal validity.

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(c) (i) Identify the inferential statistical test the researcher would need to use to analyse his data. [1]

The Sign test.

(ii) Fully justify why the inferential statistical test identified in (c)(i) would be appropriate for the researcher to use when analysing the data in this research. [3]

The Sign test is appropriate because the research is a test of difference: it looks for a difference in obedience between the familiar and the unfamiliar teacher.

The data is related, as a repeated measures design was used: the same 30 GCSE students were tested in both the Monday and the Wednesday lesson.

The data is nominal, as the independent reviewers simply categorised each student as obeyed (completed the task) or disobeyed (did not complete the task) and counted the frequencies.

(d) Evaluate **one** strength and **one** weakness of opportunity sampling. [2 + 2]

Strength: it is quicker and easier than other methods such as random sampling, as the psychologist simply used the 30 students who were readily available in one GCSE class, so no sampling frame of all students was needed and the experiment could be run in normal lessons.

Weakness: the sample is biased. All 30 students came from one GCSE class in one school, with twice as many females (20) as males (10), so they may not be representative of all students, lowering population validity and the generalisability of the findings on obedience.

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(e) The experimental design used in this research was repeated measures. Evaluate the repeated measures experimental design. [3]

A strength is that there are no participant variables, as the same students are in both conditions, so differences in personality or attitude to school cannot explain the difference in obedience, increasing internal validity. Fewer participants are needed (30 rather than 60).

However, there is an increased risk of order effects. Students always had the familiar teacher first, with no counterbalancing, so on Wednesday they may have been bored or fatigued by a similar task. Taking part twice may also let them guess the aim and show demand characteristics, which threatens internal validity.

(f) Discuss **one** way in which this research improves on Milgram's (1963) *'Behavioral Study of Obedience'*. [3]

This research improves on Milgram's ethics. Milgram deceived his 40 male participants and caused severe psychological harm: they believed they were giving electric shocks up to 450 volts and many showed extreme stress such as sweating, trembling and nervous laughter, and they were told 'you have no other choice, you must go on', limiting the right to withdraw. In this study students were only asked to complete a normal classroom task, so there was no risk of harm. It also has higher ecological validity, as obedience was measured in a real classroom with a real teacher, unlike Milgram's artificial laboratory task.

END OF PAPER

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