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CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/21**

Paper 2 Research Methods **October/November 2021**

1 hour 30 minutes

You must answer on the question paper.

You will need: Ruler

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
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INFORMATION

- The total mark for this paper is 60.
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Section A

Answer **all** questions in this section.

1 **(a)** Explain why a questionnaire is a self-report method, including an example from a core study in your answer.

It is a self-report because the data come directly from the participants, who write their own answers to written questions about themselves. E.g. Baron-Cohen et al.'s participants completed the Autism Spectrum Quotient (AQ) questionnaire about their own traits. [2]

(b) Explain **one** strength of using questionnaires in research.

Participants answer alone and anonymously, with no researcher present, so they are less likely to give socially desirable answers. This means the answers are more likely to be honest, which increases the validity of the results. [2]

2 Dement and Kleitman (sleep and dreams) compared dream duration estimates for 5-minute and 15-minute REM periods.

Write a null hypothesis for this part of the study.

There will be no difference between participants' estimates of dream duration when they are woken after 5 minutes of REM sleep and when they are woken after 15 minutes of REM sleep; any difference is due to chance. [2]

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3 In the study by Bandura et al. (aggression), inter-rater reliability was measured.

(a) Outline what is meant by 'inter-rater reliability'.

The extent to which two or more observers recording the same behaviour produce the same records (are consistent with each other). [1]

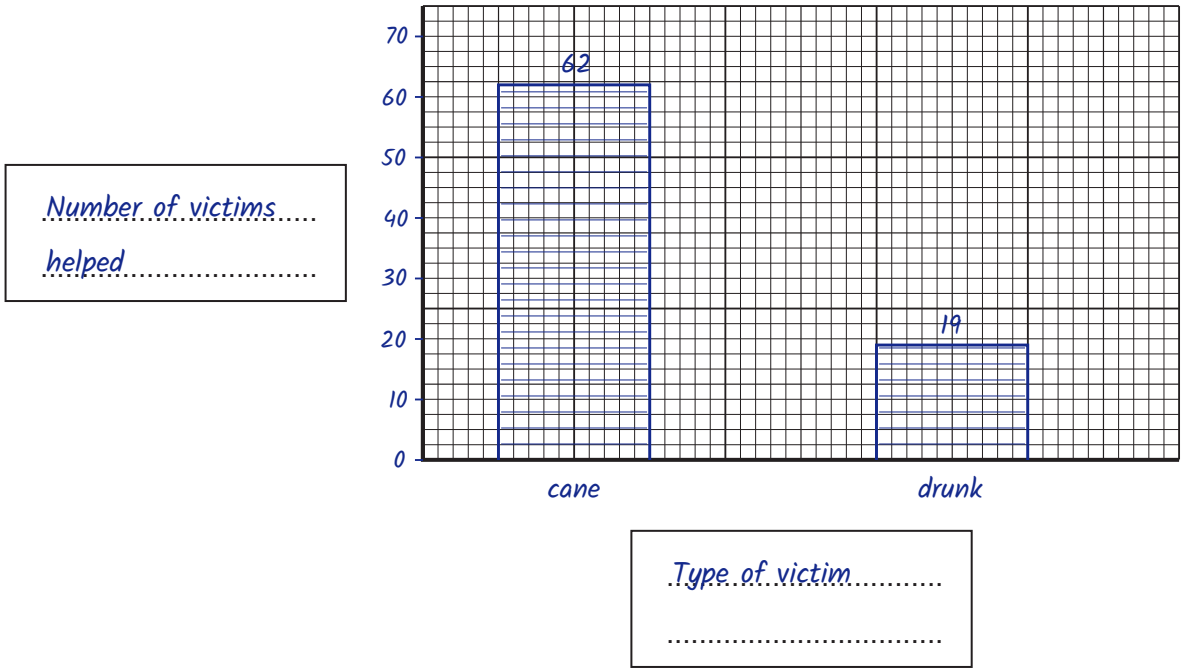
(b) Describe **one** part of the procedure that improved inter-rater reliability in this study.

The behavioural categories were clearly operationally defined before the observation, e.g. imitative physical aggression was striking the Bobo doll with the mallet, sitting on Bobo and punching it in the nose. Because both observers knew exactly what counted as each type of aggression, they were more likely to record the same behaviours for each child in each 5-second interval, so their records agreed.

[3]

4 In the study by Piliavin et al. (subway Samaritans), observers counted the total number of victims helped. The results were that 62 'cane' victims and 19 'drunk' victims were helped.

Draw a bar chart of these results. You **must** label the axes.



[4]

5 In a study on memory, participants had to recall a story. The researchers measured memory by rating the accuracy of each participant's recall of the story on a 10-point scale.

Suggest **one** weakness of using this scale to measure memory.

Rating recall on the scale is subjective; one researcher's judgement of a "9" for accuracy of recall may need much better recall than another researcher's "9", so the same participant's memory could get different scores, making the measure unreliable.

[2]

6 Describe laboratory experiments and field experiments, using any examples.

Both have an independent variable (IV) that the researcher manipulates and a dependent variable (DV) that is measured, to see whether the IV causes a change in the DV. A laboratory experiment takes place in an artificial, controlled environment, so many extraneous variables can be controlled and the procedure can be standardised. For example, Canli et al. presented the scenes in a random order and used a fixation cross between pictures to control concentration, and Dement and Kleitman told participants not to drink alcohol or caffeine on the day of the study. A field experiment takes place in the normal, everyday environment for the behaviour being studied, so participants often do not know they are in a study, but only some variables can be controlled. For example, Piliavin et al. manipulated the type of victim (cane or drunk) on a New York subway train and measured the number of helpers and speed of helping, and controlled the victim's clothing and actions by following a script.

..... [6]

Section B

Answer **all** questions in this section.

7 Bruce is planning a case study of a famous woman known worldwide for her helpfulness.

(a) Explain **one** strength of the case study research method.

The researcher can study one person in great depth and detail, often over a long time and using several techniques, so complex issues such as why she is so helpful can be explored, giving a much richer understanding than measuring a single DV in an experiment. [2]

(b) Explain **two** weaknesses of the case study research method, using Bruce's study as an example.

1 *Subjectivity: Bruce already believes this woman is exceptionally helpful, so when he interprets her interviews and behaviour he may see "helpfulness" that a different researcher would not, which makes his conclusions biased and less reliable.*

2 *Confidentiality: because she is famous worldwide for her helpfulness, it would be very hard for Bruce to disguise her identity when he reports his findings, even if he does not use her name, so her privacy may not be protected.* [4]

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8 Nola is investigating whether there is a correlation between hours of sleep and how much a person argues. She thinks that people who sleep less may argue more. Her friend Tim is making suggestions about her procedure.

(a) Nola and Tim have different ideas for recording participants' hours of sleep per night:
- Nola plans to ask participants to record this at home.
- Tim says it would be better to record this in a laboratory.

(i) Suggest **one** ethical reason why Nola's idea is better than Tim's idea.

At home participants sleep in private in their own bed, whereas sleeping in a strange laboratory with researchers watching could be distressing and make them sleep badly, which would be harmful, so Nola's idea better protects participants from harm. [2]

(ii) Suggest **one** practical reason why Nola's idea is better than Tim's idea, other than avoiding the need to use a laboratory.

Sleeping at home has higher ecological validity; participants sleep in their normal way, so the hours of sleep recorded are typical for each person and more likely to show a real correlation with how much they argue, if there is one. [2]

(iii) Suggest **one** practical reason why Tim's idea is better than Nola's idea.

In a laboratory sleep can be timed accurately by the researchers. At home, participants may not know exactly when they fell asleep or how long they were awake in the night, or may make errors or lie, so their recorded hours of sleep would be less accurate. [2]

(b) Nola finds the correlation she expected, that people who sleep less argue more.

Explain why Nola **cannot** know whether sleeping less causes people to argue more.

It is a correlation, so it cannot show cause and effect. The relationship could be the other way round: argumentative people may sleep less well, or a third factor such as stress at work could cause both less sleep and more arguing. [2]

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9 Naomi is designing an observation of helping behaviour at an entrance to a library that has a door which is difficult to open. She intends to observe people carrying many books and will record the gender of each person who helps to open the door.

(a) Naomi could either be a participant observer or a non-participant observer.

(i) Suggest **one** advantage of her being a participant observer.

She could be very close to the door, e.g. standing nearby as a library user, so she could see and hear whether the person carrying the books asked for help or whether the help was offered spontaneously, giving more accurate data.

..... [2]

(ii) Suggest **one** advantage of her being a non-participant observer.

Because she is not involved in the situation she would be more objective. If she was involved, e.g. struggling with the door herself, she might interpret behaviour as "helping" that was not really helping, or might influence whether people help.

..... [2]

(b) Explain the type of data Naomi is collecting.

Quantitative data, because she is counting the number of people who help to open the door and recording how many of the helpers are male and how many are female (nominal data in categories).

..... [2]

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(c) Situational variables could affect Naomi's results.

(i) State what is meant by a 'situational variable'.

A variable in the environment or setting, other than the IV, that could affect the DV and confound the results. [1]

(ii) Suggest how **one** situational variable could affect Naomi's results.

Whether it is raining. If Naomi observes on a rainy day, people may want to get inside quickly or may be holding umbrellas, so fewer people may stop to help open the difficult door. This means the number of helpers she records would depend on the weather and not on gender, so if she observed more male helpers on a dry day and more female helpers on a rainy day, her comparison of genders would not be valid. [3]

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Section C

Answer **all** questions in this section.

10 Brendan is planning to use a semi-structured interview in a study about road users. He intends to use a sample of people who are walking (pedestrians). Brendan will investigate the pedestrians' feelings, thoughts and actions towards other road users, e.g. other pedestrians, cyclists and drivers.

(a) Describe how Brendan could conduct a study using a semi-structured interview to investigate participants' feelings, thoughts and actions towards other road users.

Brendan would use an opportunity sample of 40 adult pedestrians (aged 18 or over) stopped on the pavement in a busy town centre shopping street, on weekdays between 10 am and 2 pm. He would approach each person, explain that the interview is about how they feel, think and act towards other road users, that it will take about 10 minutes, and get informed consent, telling them they can withdraw at any time and that their answers are anonymous. Interviews take place on a quiet bench away from the road, face to face, and are audio recorded with permission.

Being semi-structured, every participant is asked the same fixed questions in the same order, but Brendan can add follow-up questions depending on their answers. The fixed questions cover the three topics and the three types of road user. Closed questions give quantitative data, e.g. Feelings: "How do you feel when a cyclist rides on the pavement near you: calm, annoyed, frightened or angry?" Thoughts: "Do you think drivers in this town give pedestrians enough time to cross: yes or no?" Actions: "How often do you cross the road where there is no crossing: never, sometimes, often?" Open questions give qualitative data, e.g. "Describe how you felt the last time a driver did not stop for you at a crossing." Follow-up questions explore answers in more depth, e.g. "Why did that make you angry?" or "What did you do next?" A few filler questions, e.g. "How far do you walk each day?", and a lie question are included so the aim is less obvious.

Brendan writes the closed answers on a standard record sheet. Closed answers are counted, e.g. the percentage of participants feeling angry towards cyclists, drivers and other pedestrians, and shown in a bar chart. Open answers are transcribed and analysed by identifying themes, e.g. fear of fast cyclists. At the end participants are

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debriefed and thanked. [10]

(b) Identify **one** practical weakness/limitation with the procedure you have described in your answer to part **(a)** and suggest how your study might be done differently to overcome the problem.

Do **not** refer to ethics or sampling in your answer.

Weakness: because the follow-up questions differ between participants, some people are asked much more about some road users than others, so their answers are hard to compare, and Brendan's choice of follow-ups may be biased by what he expects to hear, which lowers validity.

Improvement: Brendan could write a standard set of possible follow-up questions for each fixed question (e.g. "Why do you feel that way?" and "Can you give an example?") and ask every participant the same follow-ups about drivers, cyclists and pedestrians, so the data are more comparable while still being detailed. [4]

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PSYCHOLOGY **9990/22**

Paper 2 Research Methods **October/November 2021**

1 hour 30 minutes

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Section A

Answer **all** questions in this section.

1 From the study by Schachter and Singer (two factors in emotion):

(a) Identify the sampling technique used in this study.

Volunteer (self-selected) sampling. [1]

(b) Explain how this sampling technique was used in this study.

Participants were male students at the University of Minnesota taking an introductory psychology course, who volunteered to take part in studies. In return they gained two extra points on their final exam for each hour they spent as a participant. [2]

(c) One ethical strength of this study was that health checks were done.

Explain why this is an ethical strength.

It avoided harm: the researchers checked students' health records first, so that no participant would be harmed by the injection of adrenaline (epinephrine), e.g. by its effects on heart rate. [2]

2 From the study by Bandura et al. (aggression):

(a) Identify the sample and the population in this study, using the following information:

The findings of this study on 72 children were generalised to suggest that all children learn aggression through observation.

sample: *the 72 children in the study.*

population: *all children.* [1]

(b) Explain **one** reason why generalisations should **not** be made from the 72 participants in this study, other than because of their age.

The sample was not representative because all the children came from one nursery, the Stanford University nursery school, so they probably came from similar, well-educated, middle-class families, whose children may learn aggression differently from other children. [2]

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3 In a study investigating the emotions associated with birthdays, qualitative and quantitative data are being collected. A possible problem with some of this data is subjectivity.

(a) State what is meant by 'subjectivity'.

The effect of the researcher's personal viewpoint, feelings or beliefs on how data are collected or interpreted. [1]

(b) Suggest **one** way that qualitative data could be collected for this study.

Using an interview with open questions, e.g. "Describe the emotions you feel on your own birthday and explain why you feel that way," with the answers written down or recorded in the participant's own words. [2]

4 In the study by Baron-Cohen et al. (eyes test), standard deviations were calculated on the Autism Spectrum Quotient (AQ) scores and are shown in Table 4.1.

Table 4.1

	AS/HFA group	IQ-matched group
standard deviation of AQ scores	6.0	2.9

Explain what the information in Table 4.1 indicates about the results of these two groups.

A bigger standard deviation means the scores are more spread out around the mean. So the AS/HFA group (6.0) were more varied in their AQ scores than the IQ-matched group (2.9), whose AQ scores were more similar to each other. [2]

5 Explain what is meant by 'operationalisation' in relation to the dependent variable and independent variable, using the study by Piliavin et al. (subway Samaritans).

Operationalisation means clearly defining variables so that they can be accurately manipulated or measured and the study can be replicated. Piliavin et al. operationalised the IV, type of victim, as a man who either carried a black cane and appeared sober, or smelled of alcohol and carried a liquor bottle in a brown paper bag. The DV, helping, was operationalised as the number of passengers who helped, how quickly (in seconds) help was given, and whether help came spontaneously before the model helped. [3]

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6 Describe reliability and validity, using any examples.

Reliability is the consistency of a measure or procedure; whether it produces the same results each time it is used with the same people. Inter-rater reliability is how similarly two observers record the same behaviour; test-retest reliability checks a test gives similar scores when repeated. For example, Bandura et al.'s observers had high inter-rater reliability, with a correlation of .89 for the ratings of the children's aggression, and a standardised procedure, e.g. every child saw the same model behaviour, makes a study more reliable. Validity is the extent to which a test or study measures what it claims to measure, so the results represent reality. Ecological validity is whether results generalise beyond the setting of the study; controls and standardisation increase validity. For example, Milgram's study had high validity in that the participants believed the shocks were real and showed genuine signs of tension such as sweating and trembling, but low ecological validity because giving shocks in a laboratory is very different from real situations of obedience. [6]

Section B

Answer **all** questions in this section.

7 Zayn is conducting a laboratory experiment to investigate the effects of lighting on attention. The participants' attention will be tested using a listening task in either bright light or dim light.

(a) Identify the independent variable in Zayn's study.

The level of lighting: bright light or dim light. [1]

(b) Identify the dependent variable in Zayn's study.

Attention, measured as the score on the listening task. [1]

(c) **(i)** State **one** relevant variable that Zayn should control in his study.

The amount of sleep each participant had the night before the study.

[1]

(ii) Suggest how Zayn could control the variable you suggested in **(c)(i)**.

Ask all participants to sleep for a fixed time, e.g. 8 hours, the night before.

[1]

(iii) Explain why Zayn should control the variable you suggested in **(c)(i)**.

Tired participants would be less attentive, so scores would depend on tiredness, not on the lighting. [1]

(d) Explain **one** practical reason why it is better for Zayn to test attention using a listening task rather than a visual task.

A visual task would be harder to see in dim light than in bright light, so lower scores in dim light could be caused by not being able to see the task rather than poorer attention. A listening task is not affected by light level, so it is a more valid test.

[2]

(e) Suggest **one** weakness of Zayn using a laboratory experiment to study attention.

It lacks ecological validity: in everyday life people usually have a reason to pay attention, e.g. to a teacher in a lesson or a good film, but a listening task in a laboratory is artificial and meaningless, so their attention may not be like it is in real life. [2]

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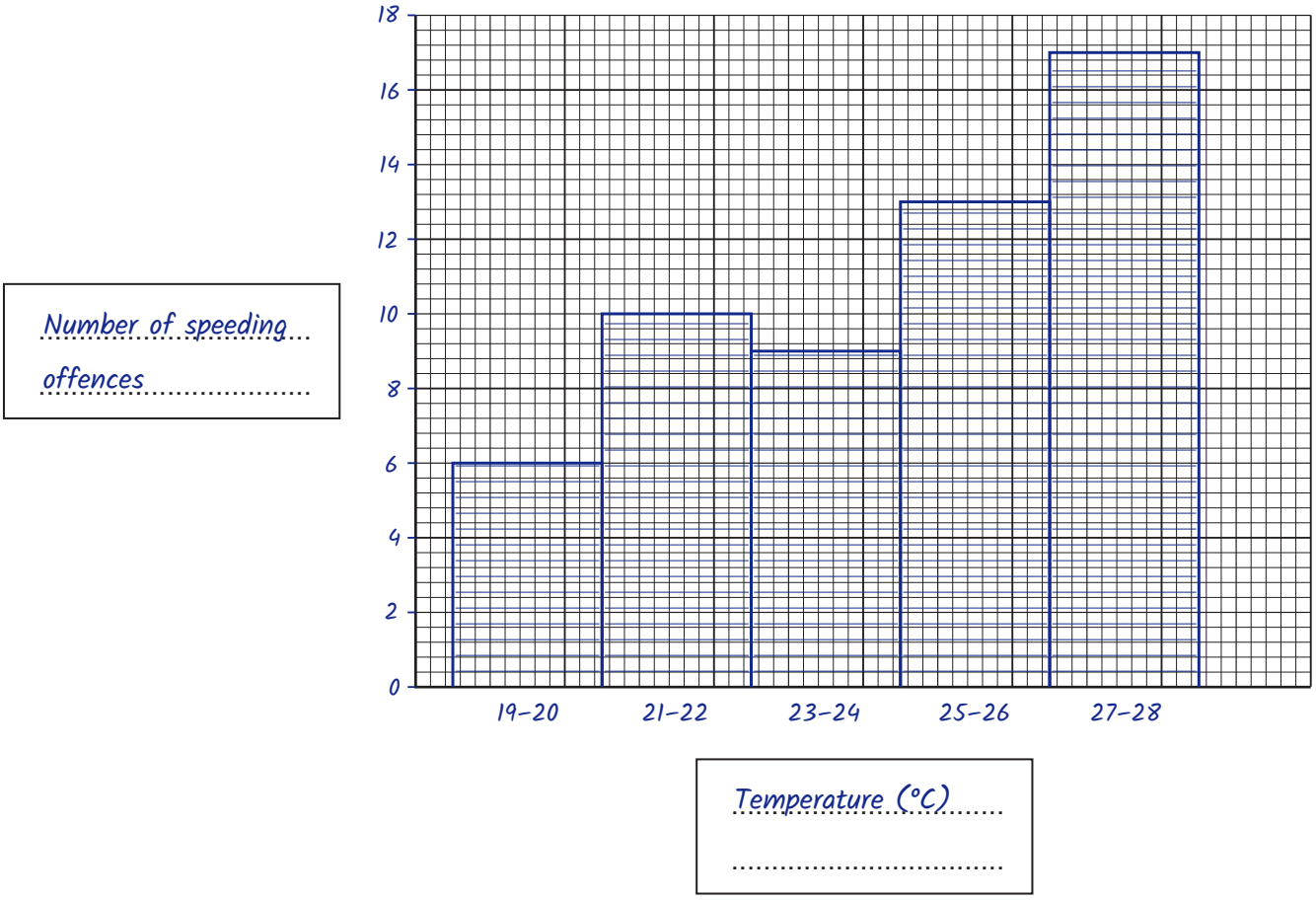
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8 Gwyn is conducting a study about obedience to traffic rules. She believes that hot weather makes people angry so they disobey rules. Each day she has recorded the daily temperature and counted the number of speeding offences in her town. Gwyn has categorised the data in Table 8.1 according to temperature.

Table 8.1

Temperature (°C)	19–20	21–22	23–24	25–26	27–28
Number of speeding offences	6	10	9	13	17

(a) Draw a histogram of Gwyn's data. You **must** label the axes.



[3]

(b) Outline what Gwyn can conclude from her data.

As the temperature increases, the number of speeding offences increases; people speed more in hotter weather. [1]

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(c) A colleague says that several situational variables may be important in Gwyn's study and that she should have controlled them.

(i) Explain how **one** situational variable could have affected Gwyn's results.

The amount of traffic: on hot days (e.g. in the summer holidays) there may be less traffic on the roads, so drivers can go faster and more speeding offences occur because the roads are clear, not because the heat makes them angry.

..... [2]

(ii) Suggest how Gwyn could have reduced the effect of the situational variable that you referred to in **(c)(i)**.

Count the traffic each day and only use data from days with a similar amount of traffic.

..... [1]

9 Hazel is conducting an overt, participant observation to identify factors that affect the emotions of residents in a home for elderly people. She is a volunteer at the home, so the residents know her.

(a) Explain **one** practical reason why it is useful that the residents know Hazel.

The residents are used to Hazel being there and feel comfortable with her, so they are more likely to behave and express emotions normally than with an unfamiliar observer. This reduces social desirability and makes her observations more valid.

..... [2]

(b) **(i)** Explain **one** ethical problem caused by the residents knowing Hazel.

There is a risk of invading the residents' privacy: because they know and trust Hazel, they may show or talk about emotions in front of her, e.g. sadness about their family, that they would not want to reveal in a study.

..... [2]

(ii) Suggest **two** ways that Hazel could overcome the ethical problem that you explained in **(b)(i)**.

1 *Make the right to withdraw clear, e.g. put up a sign in the home saying that residents can go to their rooms whenever they like if they do not want to be observed.*

.....

2 *Remind residents each day that she is observing, that they do not have to be watched, and that they can ask her not to record anything they have said or done.*

..... [4]

Question 10 appears on Page 10.

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Section C

Answer **all** questions in this section.

10 Jilpa plans to explore how personalities vary. She thinks that people's personalities can have several characteristics, for example, how serious/playful, talkative/quiet or optimistic/pessimistic they are.

(a) Describe how Jilpa could conduct a study using a structured interview to investigate a range of characteristics in people's personalities.

Jilpa would use an opportunity sample of 30 adults (aged 18 to 60) from her workplace. Each participant is interviewed individually, face to face, in the same quiet room, by Jilpa wearing the same neutral clothes and using the same friendly tone. First she gets informed consent, explains that the interview is about personality, that it takes about 15 minutes, that they can withdraw at any time and that answers are confidential (participant numbers, not names). Because the interview is structured, every participant is asked exactly the same pre-written questions in the same order, and Jilpa does not add any extra questions. There are 12 questions, four on each characteristic: serious/playful, talkative/quiet and optimistic/pessimistic. Most are closed questions giving quantitative data, e.g. "When you are with friends, are you usually serious or playful?" (serious / playful), and "On a scale of 1 (very quiet) to 5 (very talkative), how talkative are you when you meet new people?" Some are open questions giving qualitative data, e.g. "Describe how you feel when you think about next year." A few filler questions, e.g. "What is your favourite food?", are included so the aim is less obvious. Jilpa writes each answer on a standard answer sheet. For each characteristic, the four closed answers are scored (e.g. playful = 1, serious = 0, and the 1 to 5 ratings added) to give a score, e.g. a talkativeness score out of 20, so each person has a personality profile. The median and range of each score are calculated and shown in bar charts to show how personalities vary. Open answers are analysed for themes, e.g. hope or worry about the future. At the end participants are debriefed and thanked.

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..... [10]

(b) Identify **one** practical weakness/limitation with the procedure you have described in your answer to part **(a)** and suggest how your study might be done differently to overcome the problem.

Do **not** refer to ethics or sampling in your answer.

Weakness: participants may give socially desirable answers, e.g. saying they are more playful, talkative and optimistic than they really are because these traits seem more likeable. This means the personality scores would not be valid.

Improvement: Jilpa could also give a close friend of each participant the same structured interview about the participant, e.g. "Is your friend usually serious or playful?", and compare the two sets of scores, using the average of the self and friend scores as the final personality profile.

..... [4]

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Cambridge International AS & A Level

CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/23**

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Section A

Answer **all** questions in this section.

1 **(a)** Outline what is meant by 'fatigue effects'.

A decline in participants' performance caused by doing an experimental task more than once or for a long time, because they become tired or bored. This means the DV is affected by something other than the IV, so it reduces validity.

..... [2]

(b) In the study by Pepperberg (parrot learning), fatigue effects could have occurred.

State **two** examples of the parrot's behaviour that suggest fatigue effects did occur.

1 *He started preening himself instead of answering the question.*

2 *He refused to answer or asked to go somewhere else (e.g. to the gym).* [2]

2 Explain why opportunity sampling may **not** produce a representative sample.

Participants are chosen from whoever is available at that time and place, so they are likely to be similar, e.g. all students. [1]

3 Studies using animals should follow the ethical guideline of 'deprivation and aversive stimuli'. The study by Yamamoto et al. (chimpanzee helping) followed this ethical guideline.

Explain **one** feature of this study that ensured the chimpanzees were **not** exposed to deprivation/ aversive stimuli.

Aversive stimuli means not exposing animals to anything unpleasant. The chimpanzees were not punished or deprived of food or water to make them help; instead the chimpanzee that received the tool was rewarded with a juice drink.

..... [2]

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4 In the study by Canli et al. (brain scans and emotions), several types of quantitative data were collected, including data from fMRI (functional Magnetic Resonance Imaging).

(a) Describe **two** quantitative measures in this study, other than the data from fMRI.

1 *Ratings of emotional intensity: for each of the scenes participants rated how emotionally intense it was on a scale from 0 (not emotionally intense) to 3 (extremely emotionally intense).*

2 *Memory: in a surprise recognition test three weeks later participants said whether each scene was remembered, familiar or forgotten, giving the number or percentage of scenes remembered.* [4]

(b) For **one** of the quantitative measures you described in **(a)**:

(i) Explain **one** reason why it may be a valid measure.

Rating of emotional intensity: it is a standardised scale, so each participant can consistently say whether one scene was more or less intense than another, which measures their own experience of emotion well. [2]

(ii) Explain **one** reason why it may **not** be a valid measure.

It is subjective: participants must interpret the scale themselves, so one person's "2" may be another person's "3". These individual differences mean the scores may not truly reflect how intense the emotion was. [2]

5 In the cognitive approach, studies often need to deceive participants.

Explain why deception was necessary in the study by Andrade (doodling).

If participants had known about the memory test they would have deliberately tried to remember the names, so the effect of doodling could not be tested. [1]

6 Describe covert observations and overt observations, using any examples.

In an overt observation the participants know they are being observed; the observer's role is obvious, e.g. they hold a clipboard or are introduced as a researcher. It raises fewer ethical issues because participants can give informed consent, and the observer can get close to participants, but they may change their behaviour, e.g. because of demand characteristics. For example, in Saavedra and Silverman's study the boy knew the researchers were watching him during the in vivo button tasks. In a covert observation the participants are unaware that they are being observed, because the observer is hidden, e.g. behind a one-way mirror or using CCTV, or is disguised as a member of the group. This improves validity because demand characteristics and social desirability are reduced. For example, Bandura et al. watched the children through a one-way mirror, and Piliavin et al.'s observers pretended to be ordinary passengers on the subway train.

..... [6]

Question 7 appears on Page 6.

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Section B

Answer **all** questions in this section.

7 Dhia is investigating when children learn to understand differences between shapes. She is comparing children aged 4 years and 8 years. Dhia will test their ability by asking them to sort wooden shapes into triangles, squares or circles.

(a) Suggest **two** ways that Dhia could measure a child's performance on this test.

1 *The time taken (in seconds) to sort all the shapes into the three groups.*

2 *The number of shapes sorted into the correct group (or the number of errors).*

[2]

(b) Ethical guidelines suggest that even when consent has been given by a parent, a child should still be asked if they want to participate in a way that they will understand.

Suggest how Dhia could attempt to obtain informed consent from the children in a way that they will understand.

She could use easy words, e.g. "Would you like to play a shape sorting game with me? You don't have to if you don't want to, you can play on your own instead." She would only test children who say yes.

[2]

(c) Children may express their right to withdraw in different ways from adults.

Suggest how Dhia might know that a child wants to withdraw from her experiment.

The child might stop sorting the shapes or get up and walk away from the table, because they are bored or afraid. They might also look distressed, e.g. cry or ask for their parent, as they want someone familiar.

[2]

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(d) The 4-year-old children had been learning about shapes at school the week before Dhia's study.

Explain the possible effect of this on Dhia's findings.

It would make her conclusions less valid. The 4-year-olds would have just learned to tell the shapes apart, so they would sort better than is normal for their age. Only the 4-year-olds had this practice, not the 8-year-olds, so the DV (sorting performance) would be affected by a variable other than the IV (age). The difference between the age groups would look smaller than it really is, so Dhia would underestimate how much understanding of shapes develops with age. [3]

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8 Bai is conducting a correlational study about pain and hours of daylight. He thinks that people experience more pain on days when there is less sunlight. He has asked for volunteers from a specialist centre for back pain.

(a) Bai plans to collect his data about pain using a questionnaire.

Explain **one** reason why it may be better for him to use an interview to collect this data.

In an interview the questions can be explained and tailored to each person, e.g. Bai could ask follow-up questions about the particular pain each patient feels and what they did on bright or dull days, so he gets more detailed and accurate data about their pain. [2]

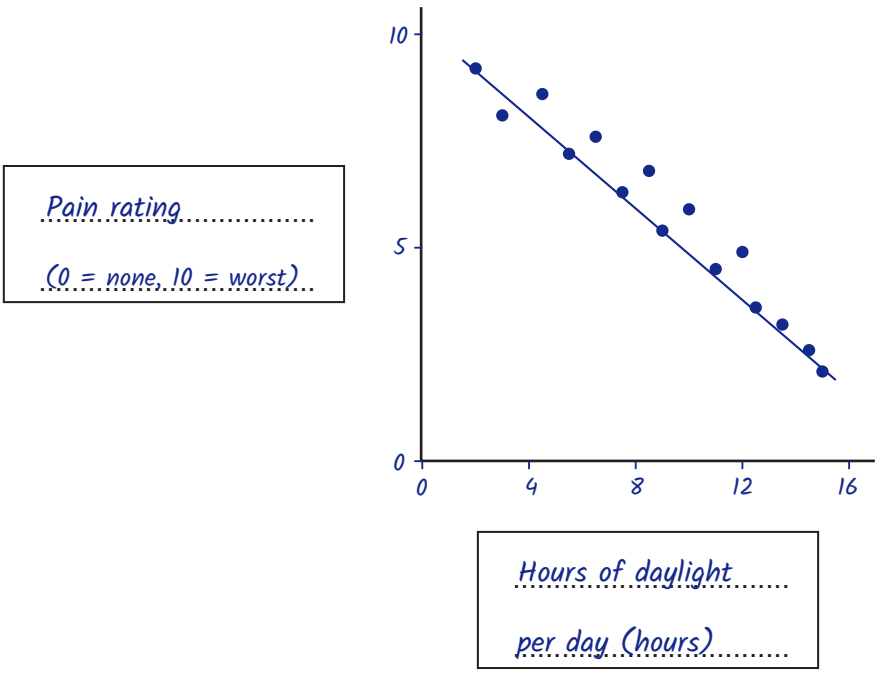
(b) **(i)** Suggest **one** disadvantage of using participants from a specialist centre for back pain.

All the patients have back pain severe enough to attend a specialist centre, so the findings may not generalise to people with mild pain or other types of pain, e.g. headaches. [2]

(ii) Suggest **one** alternative source of participants. Justify your answer.

Bai could use a random sample of patients registered at a local GP surgery, picked from the patient list. This would include people with different types and levels of pain, as well as some with none, so the results would be more generalisable to the whole population. [2]

(c) Sketch a graph of the results Bai expects to find on the axes below. You **must** label the axes.



[3]

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9 Mitesh is investigating the effect of doodling on recall of animal noises. He provides pencils and doodling paper for all participants and tells them that they will hear a recording of animal noises that they will have to recall. Mitesh notes which participants doodle while they listen to the recording.

(a) Suggest how Mitesh could encourage participants to doodle, other than by telling them to doodle.

He could give out paper with shapes already printed on it and tell participants it is there to keep them amused. He could also make the recording long and repetitive, so they get bored and want something to do while listening.

..... [2]

(b) The participants who doodled recalled more animal noises than the participants who did not doodle. However, Mitesh cannot conclude that doodling causes better recall.

Suggest **one** reason why Mitesh **cannot** conclude that doodling causes better recall.

Participants were not randomly allocated to conditions; they chose whether to doodle. People who naturally doodle may already have better memories for noises than non-doodlers, so this participant variable, not doodling, could explain their better recall.

..... [2]

(c) Mitesh did not deceive his participants.

Explain why it was necessary for him to debrief his participants.

Participants were not told that the aim was to test the effect of doodling on recall, so they needed to be informed of it. Also, those who recalled few animal noises may feel discouraged, so debriefing returns them to the state they were in before the study.

..... [2]

Section C

Answer **all** questions in this section.

10 Mandy wants to investigate the effects of phobias on the way people socialise, such as how friendly they are and the social groups or clubs they belong to.

(a) Describe how Mandy could conduct a study using a questionnaire to investigate the effects of phobias on the way people socialise.

Mandy would place adverts in phobia support groups and online forums asking for volunteers aged 18 to 65 with a diagnosed phobia, e.g. a social phobia, fear of spiders or fear of heights, aiming for 60 participants. A comparison group of 60 people without a phobia would be recruited the same way. The questionnaire is posted online with a consent page explaining the aim, that it takes 15 minutes, that they can stop at any time and that it is anonymous. Participants fill it in alone at home.

Section 1 asks about the phobia with closed questions, e.g. "What is your phobia?" (choose from a list) and "How much does your fear affect your daily life? 1 (not at all) to 5 (very much)." Section 2 asks about socialising. Closed questions give quantitative data, e.g. "How many social groups or clubs do you belong to? 0 / 1 / 2 / 3 or more", "How many times did you meet friends last week?" and "How friendly are you with strangers, from 1 (not at all) to 5 (very)?" Open questions give qualitative data, e.g. "Describe how your phobia affects the way you make friends." Filler questions, e.g. "What is your favourite hobby?", hide the aim, and a lie question, e.g. "I have never been nervous in my life", checks honesty.

Closed answers are scored, e.g. the number of clubs and the friendliness rating out of 5. Mean scores for the phobia and non-phobia groups are compared in bar charts, and the strength of fear ratings can be correlated with friendliness. Open answers are analysed for themes, e.g. avoiding places where the feared object may be. Participants are given a debrief page with the aim and details of support organisations, in case answering caused distress.

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..... [10]

(b) Identify **one** practical weakness/limitation with the procedure you have described in your answer to part **(a)** and suggest how your study might be done differently to overcome the problem.

Do **not** refer to ethics or sampling in your answer.

Weakness: the closed questions only give a number, e.g. how many clubs someone belongs to, so they do not show why: a person may belong to few clubs because of lack of time or money, not because of their phobia, which lowers validity.

Improvement: after each closed question about socialising, Mandy could add a follow-up closed question, e.g. "Does your phobia stop you joining clubs? yes / sometimes / no", and only count answers linked to the phobia, so she knows the effect is caused by the phobia and not other reasons.

..... [4]

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