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CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/21**

Paper 2 Research Methods **October/November 2022**

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

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.
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INFORMATION

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- The number of marks for each question or part question is shown in brackets [ ].

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Section A

Answer **all** questions in this section.

1 The study by Milgram (obedience) used a shock generator, which looked real.

Explain why it was necessary that the shock generator looked real.

So that participants believed they really were giving painful shocks to the learner, which avoided demand characteristics. Otherwise they would have known they could not hurt anyone and might have gone to 450 V easily, so the results would not show genuine obedience. [2]

2 Bill has two groups of children in his study and writes a directional hypothesis. It states that 'Older children are more obedient than younger children'. He then decides that this might not be correct and uses a non-directional hypothesis instead.

(a) Suggest a non-directional hypothesis for Bill's study.

There is a difference in obedience between older children and younger children. [1]

(b) State how Bill will find the mode for the age of the group of younger children.

Find the age (in years and months) that occurs most often in the group of younger children. [1]

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(c) Suggest **two** reasons why it could be ethically more difficult to measure obedience in children than in adults.

1 *Children are too young to give fully informed consent, as they may not understand what "obedience" means or what they will be asked to do, so they would not really know what they were agreeing to.*

2 *Children are more vulnerable to pressure from adults and are taught to obey them, so they may not feel able to use their right to withdraw and may keep obeying even when it upsets them, putting them at risk of psychological harm.*

[4]

3 Describe **two** features of a laboratory experiment. Use a different example from the study by Schachter and Singer (two factors in emotion) for each feature.

1 *The IV is manipulated by the researcher. Schachter and Singer injected participants with either adrenaline or a saline placebo, and changed whether they were informed, misinformed or ignorant about the side effects.*

2 *There are controls and a standardised procedure. Schachter and Singer's stooge followed a script, so every participant in the euphoria condition saw the same behaviours, e.g. paper basketball and the hula hoop, and all injections looked the same.*

[4]

4 Baron-Cohen et al. (eyes test) presented the eyes test results on a graph showing the percentage of participants who gained each score. The graph is shown in Fig. 1.

(a) Label the axes on Fig. 1, using the answer spaces below.

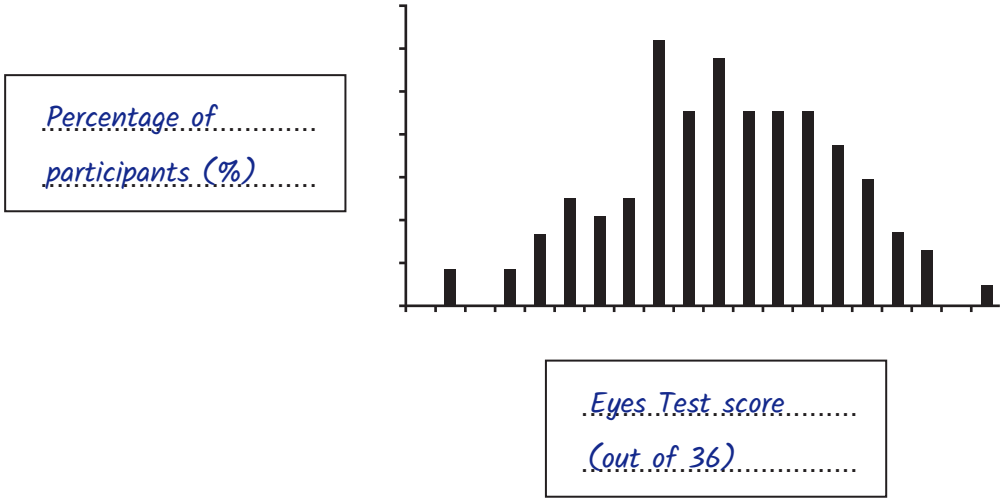


Fig. 1

[2]

(b) Name the type of distribution shown in Fig. 1.

Normal distribution. [1]

5 Participants in a study are learning to throw a ball through a hoop.

Suggest how the variable of 'learning' could be operationalised in this study.

The number of balls out of 10 that go through the hoop on each trial; an increase shows learning. [1]

6 Describe the ethical guidelines of 'species and strain' and 'numbers' in relation to animals, using any examples.

Species and strain: researchers should choose the species (and strain) least likely to suffer pain or distress that can still answer the research question. Each species has different needs, e.g. for space, warmth and cover, which may differ with age and sex, and endangered species should not be used. For example, Pepperberg studied an African grey parrot, a species that is used to interacting with people, so Alex was not distressed by daily training, whereas Yamamoto et al. needed chimpanzees to study helping, a complex behaviour.

Numbers: the smallest number of animals possible should be used, so that as few animals as possible are exposed to harm or distress, although enough must be used to give valid, reliable results. For example, Pepperberg only used one parrot, Alex, and Yamamoto et al. tested only five chimpanzees.

[6]

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Section B

Answer **all** questions in this section.

7 Kate is using a questionnaire to investigate how participants could feel about people who are older than them. The emotions she is investigating are:

- boredom
- empathy
- fear
- happiness.

(a) (i) Kate needs to define each of these emotions.

Suggest how Kate could operationalise **two** of the emotions that she is investigating.

1 *Boredom: rating the older person as dull and not interesting to talk to.*

.....

2 *Fear: feeling scared or worried that the older person may harm them.*

..... [2]

(ii) For **one** of your suggestions in **(a)(i)**:

Explain why Kate could misinterpret this emotion when gathering data in her study.

Emotion: .....*Fear*.....

A participant may be worried about someone else, e.g. an ill grandparent, rather than scared of older people, so Kate would wrongly record fear of older people. [1]

(b) Kate measures how strongly the participants feel each emotion about people who are older than them, using a score from 0–10.

(i) Kate wants to find the median 'happiness' score.

Outline how to find a median score.

Put all the happiness scores in rank order from lowest to highest; the middle score is the median (if two are in the middle, add them and halve). [1]

(ii) Kate wants to use a graph to plot the median results for each of the four emotions.

Name the **most** appropriate type of graph for Kate to use.

A bar chart. [1]

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(iii) Kate calculated the standard deviation of scores for each emotion. The standard deviations are shown in Table 1.

Table 1

Emotion	boredom	empathy	fear	happiness
Standard deviation	1.4	3.2	2.2	2.6

Explain which emotion had the widest spread of scores.

Empathy, because it has the largest standard deviation (3.2), so its scores varied the most from the mean.

..... [2]

8 Gill is planning a structured interview about disruptions to sleep patterns. She is investigating the effects of work, sport and family. She begins by writing four questions:

A Describe how your sleep pattern changes when extra family members stay for the night.
B How long do you sleep after you have participated in sport compared to when you have not participated in sport? More time / less time.
C Is your sleep quality in the week compared to the weekend better, worse or about the same?
D Explain how any other factors affect your sleep patterns.

(a) Identify **one** closed question from A to D.

B ..... [1]

(b) Identify **one** open question from A to D.

A ..... [1]

(c) Gill plans two more questions to use in her structured interview:

E Is your sleep better or worse if you eat a meal close to bedtime? Better / worse.
F Explain how your sleep pattern is affected if you work at night.

Suggest **one** problem that Gill could have when using **one** of the new questions.

Question E or F: ..... *E*

It is a closed question with only "better" or "worse" as choices, so participants cannot elaborate. Someone whose sleep is not affected, or for whom it depends on what or how much they eat, cannot say so and must pick one, so the data would be inaccurate. ..... [2]

(d) Gill's friend reads the six questions and says it would be better if she conducted a semi-structured interview instead of her structured interview.

(i) Explain what makes Gill's interview a structured interview.

The questions are fixed in advance and every participant is asked the same questions in the same order, with no extra questions. [1]

(ii) Suggest how Gill could change her structured interview into a semi-structured interview.

Keep some fixed questions but add new follow-up questions based on what each participant says in their answers. [1]

(e) Gill notices that people who look like they have not slept well often refuse to take part in the study.

Explain how this problem could affect the results of Gill's study.

The sample would be biased and unrepresentative, lowering the validity and generalisability of the results. People with poor sleep would be under-represented compared with the whole population, so the participants would mostly be good sleepers. This would make it seem that work, sport and family disrupt sleep less, and that people sleep better, than they really do.

[3]

9 Manas is a researcher at a drug company and is conducting an experiment to test a new drug for patients who have phobias. The drug is a clear, tasteless liquid that should help the patients to relax during therapy. Manas selects 10 patients who will take the new drug and 10 other patients who will be given water, which is also clear and tasteless. The patients in both groups believe they are taking the new drug.

(a) Identify the experimental condition **and** the control condition in this experiment.

experimental condition: *the 10 patients given the new drug.*

control condition: *the 10 patients given water (a placebo).* [1]

(b) Manas has controlled two variables. The drug is:
- a clear liquid
- tasteless.

(i) Suggest **two** other controls that could be used in this experiment to keep the experimental condition and the control condition as similar as possible.

1 *Both liquids are given in identical unlabelled cups, at the same temperature.*

2 *The drug should have no smell, like water, and both groups have the same therapist.* [2]

(ii) Explain why it is important to keep the experimental condition and the control condition as similar as possible.

So that any difference in the DV (how relaxed the patients are) is due only to the IV, the new drug, and not to other variables. [1]

(c) Suggest **two** ethical problems with this experiment.

Deception: the patients in the control group are being lied to, because they believe they are taking the new drug when they are only given water. So they cannot give fully informed consent.

Protection from harm: the new drug is still being tested, so patients in the drug group could be physically harmed by unknown side effects, and control patients may make no progress in their therapy as they are only getting water. [4]

Section C

Answer **all** questions in this section.

10 Dr Angelo wants to investigate how young children respond when their teachers are helpful. She has seen teachers being helpful to children in the classroom and in the playground.

(a) Describe how Dr Angelo can conduct an observational study to investigate the behaviour of children when their teachers are helpful.

Dr Angelo would conduct a naturalistic, structured observation in a primary school, with one class of 30 children aged 5 to 7, chosen by opportunity sampling from a local school whose head teacher and parents give consent. She would be a non-participant, covert observer: she would sit quietly at the back of the classroom, appearing to mark work, and watch the playground from a staff room window, so the children do not know they are being watched and behave naturally.

Helpful teacher behaviour would be operationalised as the teacher kneeling beside a child to explain a task, giving a pointer on a question, or helping a child who has fallen over in the playground. Each time this happens, the child's response in the next 30 seconds would be tallied on a checklist with behavioural categories: smiling at the teacher, saying "thank you", carrying on with the task (looking at the work and writing), asking another question, and ignoring the teacher (looking away or chatting).

Observations would take place in the classroom during the one-hour morning maths lesson and in the playground during the 20-minute morning break, every day for one week, so responses in the two settings can be compared. A second observer would use the same categories at the same time, and their tallies would be correlated to check inter-rater reliability.

The total and percentage of each response would be calculated for the classroom and the playground and shown in a bar chart. Children would be identified by numbers, not names, and parents could withdraw their child's data afterwards.

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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.

In a busy classroom and playground, many children respond at once, so the observers may miss some responses or tally them wrongly, which lowers reliability and validity. To overcome this, Dr Angelo could video-record the lessons and break times with small fixed cameras. Both observers could then watch the recordings separately, pausing and replaying them so that every response is recorded, and compare their tallies to check inter-rater reliability.

..... [4]

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PSYCHOLOGY **9990/22**

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Section A

Answer **all** questions in this section.

1 The hypothesis for a study is 'Adults with children worry more than adults without children'.

(a) State whether this is a directional hypothesis or a non-directional hypothesis. Include a reason for your answer.

Directional, because it states which group will worry more (adults with children), not just that there will be a difference. [1]

(b) Write a null hypothesis for this study.

There will be no difference in how much adults with children and adults without children worry; any difference is due to chance. [1]

2 From the study by Yamamoto et al. (chimpanzee helping):

(a) Outline what is meant by 'reliability', using this study as an example.

Reliability means consistency: using the same procedure or measure gives the same results each time. In Yamamoto et al, each trial lasted a maximum of 5 minutes, so no chimpanzee had longer than another to help, and all were tested in the same way. [2]

(b) Suggest **one** way to improve reliability in this study.

Give all the chimpanzees the same familiarisation with the tools so they have the same level of experience before testing. [1]

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3 In the study by Pepperberg (parrot learning), quantitative data was collected from the questions about 'same' and 'different'.

(a) Outline what was observed to produce the quantitative data in this study.

Whether Alex correctly named the category (colour, shape or matter) that was the same or different between two objects. [1]

(b) Qualitative data can also be useful in studies. Pepperberg could have collected qualitative data by observing the parrot.

(i) Describe what is meant by 'qualitative data'.

Detailed, in-depth, descriptive data, e.g. a written description of behaviour.

..... [1]

(ii) Describe **one** behaviour that could have been observed to produce qualitative data in this study.

A description of what Alex was doing when he fidgeted or turned away before answering. [1]

(iii) Explain why qualitative data for the behaviour you identified in **(b)(ii)** would have been useful in this study.

It could show Alex's frustration or level of concentration. For example, if he fidgeted before answering he may not really have known the answer and was guessing, so a correct answer would not show true understanding of "same" and "different". [2]

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4 In the study by Dement and Kleitman (sleep and dreams), brain activity during sleep was recorded using an EEG (electroencephalograph). Another way to record brain activity is with fMRI (functional magnetic resonance imaging).

Suggest **two** reasons why using an EEG to record brain activity during sleep is a more appropriate choice than using an fMRI.

An fMRI scanner is very noisy, while an EEG is silent. The noise could stop participants falling asleep or wake them, disrupting their normal sleep and dreams.

An EEG only needs electrodes attached to the scalp, while an fMRI needs the person to lie still in an enclosed machine, which can trigger claustrophobia. This is distressing, so they would not sleep normally all night, and claustrophobic people could not take part, limiting generalisability.

..... [4]

5 In the study by Andrade (doodling), a median could have been calculated for the results of the doodling group and the control group.

Outline how a median could have been calculated for the number of names recalled by each group in this study.

For each group separately (doodling and control), put all the participants' scores for the number of names recalled in rank order and find the middle score. If there are two middle scores, add them together and divide by 2.

..... [2]

6 Describe the ethical guidelines of 'deception' and 'confidentiality', using any examples.

Deception: participants should not be lied to or misled about the aim or procedure, because then they cannot give informed consent and may be distressed. For example, Milgram told participants the study was about the effect of punishment on learning and that the shocks were real. However, deception is sometimes needed to avoid demand characteristics, as Milgram's participants might have gone to 450 V if they knew the shocks were fake. Deceived participants must be debriefed.

Confidentiality: participants' personal information must be kept private so they cannot be identified. They should be identified by numbers or initials rather than names, data should be stored securely and only the researchers should have access. For example, Dement and Kleitman referred to participants by their initials, and Saavedra and Silverman did not name the boy in their case study.

..... [6]

Section B

Answer **all** questions in this section.

7 Shula is investigating whether there are differences in the way that younger and older people behave when they see each other. She is using observations to record the following behaviours:

- smiling
- waving
- shouting.

(a) Explain whether Shula is conducting a structured observation or an unstructured observation.

Structured, because she is recording pre-set behavioural categories; whether people smile, wave or shout when they see each other, e.g. tallying these, rather than writing a description of everything that happens.

..... [2]

(b) **(i)** Explain why it would be better for Shula to conduct a covert observation than an overt observation.

In a covert observation people would not know Shula was watching them, so they would behave naturally and would not change how they smile, wave or shout when they see each other because they were being watched, increasing validity.

..... [2]

(ii) Suggest **one** problem with Shula conducting a covert observation.

Shula cannot break her cover, so if people move out of her view she cannot follow them and her records of their greetings would be incomplete. From a hidden position she may also be unable to see small expressions such as smiles clearly. ..... [2]

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8 Mahi is observing the effect of music on emotions. In part of her study she is collecting data from 20 participants about their emotional responses to songs. She is using the following categories to observe emotional responses:

- angry
- bored
- happy
- relaxed.

(a) **(i)** Suggest how Mahi could operationalise **two** of these categories of observed emotional responses.

1 *Angry: the participant frowns or clenches their fists.*

.....

2 *Happy: the participant smiles or laughs.*

.....

[2]

(ii) For **one** of your suggestions for the operationalisation of a category in part **8(a)(i)**:

Explain why Mahi could misinterpret or incorrectly categorise an observed emotional response of a participant in her study.

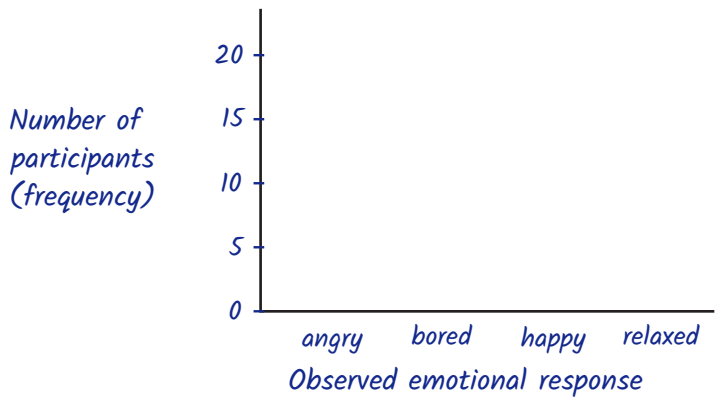
category: .....*Angry*.....

A participant may frown because they are concentrating or cannot hear the song clearly, not because they are angry. [1]

(b) Mahi is collecting data in the table below. This is the number of participants who showed each of the four emotional responses. She wants to display this data on a bar chart.

	Observed emotional responses			
	angry	bored	happy	relaxed
Number of participants showing each emotional response				

Label the axes for the bar chart that Mahi will use to display her results.



[3]

(c) In a second study, Mahi's participants will listen to different types of music. She expects that fast music will make the participants feel happy and slow music will make them feel unhappy.

(i) Explain **one** ethical problem with the design of this study.
Do **not** refer to deception or confidentiality in your answer.

Protection from psychological harm: participants who listen to the slow music may be made to feel unhappy, and could leave the study still feeling sad.

..... [2]

(ii) Suggest **one** way that Mahi could solve the ethical problem you explained in part **8(c)(i)**.

Return all participants to their normal mood before they leave, e.g. by playing them fast, happy music at the end and checking how they feel during the debrief.

..... [2]

9 Syd is using an experiment to test whether epinephrine affects sleep. He has two groups of participants, one group receives an epinephrine injection and the other group receives a saline injection. The participants do not know what their injection contains. Each participant is tested at a town centre laboratory on a different night over a 20-night period. The town centre is very busy at the weekend but quiet during the week.

(a) Explain why it is important that participants do **not** know which condition they are in during an experiment.

So they are not affected by expectations or demand characteristics and do not change their behaviour. Otherwise Syd would not know whether the epinephrine or their expectations were affecting their sleep, so cause and effect could not be determined. [2]

(b) Identify Syd's experimental design. Include a reason for your answer.

Independent measures design, because different participants are in the epinephrine group and in the saline (control) group, so each participant only does one condition.

[2]

(c) Suggest **one** participant variable that could affect Syd's experiment.

People's normal sleep habits, as some naturally need or get more sleep than others. Differences in sleep between the groups could be due to the participants' normal sleep patterns rather than the epinephrine.

[2]

(d) Suggest **one** situational variable that could affect Syd's experiment.

Noise from the busy town centre at weekends. Participants tested on a weekend night may sleep worse because of the noise, so differences in sleep could be caused by when in the week they were tested, not by the injection.

[2]

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Section C

Answer **all** questions in this section.

10 Dr Mitchell wants to investigate how physically active people are, and he believes that this may be related to how much they use social media.

(a) Describe how Dr Mitchell could conduct a correlational study to investigate the relationship between how physically active people are and how much they use social media.

Dr Mitchell would conduct a correlational study with 100 adults aged 18 to 40, recruited by volunteer sampling through an advert at a local shopping centre and online. All give informed consent, are told they can withdraw and are identified by numbers.

Co-variable 1, physical activity, would be operationalised as the mean number of steps per day over 7 days, measured by a step-counting fitness tracker worn on the wrist from waking until bed. Co-variable 2, social media use, would be operationalised as the mean number of minutes per day spent on social media apps (e.g. Instagram, TikTok, Facebook) over the same 7 days, taken from the screen-time record on each participant's phone, which they send to the researcher as a screenshot.

Participants would also complete a short online questionnaire at home with standardised instructions, including closed questions such as "How many minutes of exercise did you do on each day last week?" and a rating scale: "How physically active are you? 1 = not at all, 10 = extremely active." Everyone would be measured in the same normal week, not during holidays.

Each participant would have a pair of scores (mean steps per day and mean minutes of social media per day). These would be plotted on a scattergraph and a correlation coefficient calculated. Dr Mitchell expects a negative correlation: the more time people spend on social media, the fewer steps they take, so the less physically active they are.

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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.

Participants know their steps and screen time are being measured, so during the week they may walk more and use social media less than usual to look good (social desirability), which makes the data invalid. To overcome this, Dr Mitchell could use data already stored on their phones from the previous month, i.e. step counts from the phone's health app and screen-time history, recorded before they knew about the study, so their behaviour could not have been affected.

.....

..... [4]

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CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/23**

Paper 2 Research Methods **October/November 2022**

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Section A

Answer **all** questions in this section.

1 Dement and Kleitman (sleep and dreams) investigated a correlation between the length of the dream narrative and the duration of the REM period.

Describe the correlation that was found.

A positive correlation: the longer the REM period before the participant was woken, the longer the dream narrative (the more words in their description of the dream).

..... [2]

2 A researcher is planning to investigate forgetting in very old people. However, measuring forgetting in very old people can be more ethically and practically difficult than measuring forgetting in younger people.

(a) Suggest **one** ethical reason why measuring forgetting in very old people can be difficult.

Consent: very old people, e.g. those with dementia, may lack the capacity to understand what the study involves, so they may be unable to give fully informed consent to tests of their forgetting.

..... [2]

(b) Suggest **one** practical reason why measuring forgetting in very old people can be difficult.

Very old people may have poor vision or hearing, so they may not see or hear the material to be remembered properly. Poor scores may then be due to these problems rather than forgetting, so the measure would lack validity.

..... [2]

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3 In the study by Laney et al. (false memory) two of the questionnaires used were the Food History Inventory (FHI) and the Restaurant Questionnaire (RQ).

(a) (i) Each of these questionnaires included a 'critical item'.

Explain what is meant by a 'critical item'.

The question that measures the DV, e.g. "Loved asparagus the first time you tried it" on the FHI. [1]

(ii) Describe how the critical item in **either** the FHI **or** the RQ was measured.

FHI: rated on a scale from 1 (definitely did not happen) to 8 (definitely did happen). [1]

(b) Explain the purpose of the items that are **not** critical items in the FHI and the RQ.

They were fillers to hide the aim and avoid demand characteristics, so participants believed the study was about food preferences and personality and did not suspect it was about false memories.

[2]

4 A teacher records each student's test results once a week. At the end of the year he calculates the mean of the test results for each student.

Describe how the mean would be calculated in this study.

For each student, he would add up all of their weekly test scores for the year (including any zeros) and divide this total by the number of tests (the number of weeks).

[2]

5 In the study by Yamamoto et al. (chimpanzee helping), a small sample of chimpanzees was tested.

(a) Explain **one** practical weakness of using this small sample.

The results cannot be generalised, as a small sample is unlikely to be representative. The few chimpanzees tested may be more (or less) helpful than most chimpanzees, so the findings about helping may not apply to chimpanzees in general.

..... [2]

(b) Explain **one** ethical strength of using this small sample.

It follows the ethical guideline of "numbers": by testing only a few chimpanzees, the smallest possible number of animals was used, so fewer animals were exposed to any stress or distress.

..... [2]

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

A laboratory experiment takes place in a controlled environment. The researcher manipulates the IV and measures its effect on the DV, while controlling extraneous variables by standardising the procedure. For example, in Andrade's study the IV was doodling or not doodling while listening to a monotonous phone message, and the DV was the number of names recalled; all participants heard the same recording.

A natural experiment has an IV that is not manipulated by the researcher but varies naturally, e.g. a natural event, although the DV is still measured. Participants cannot be randomly allocated to conditions, so there are few controls. For example, a study of the introduction of television to a remote community could compare children's aggression before and after TV became available.

..... [6]

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Question 7 appears on Page 6.

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Section B

Answer **all** questions in this section.

7 Pranit uses a questionnaire to investigate whether psychology students know more about operant conditioning than the general public. His questions are:

A Describe what you think a 'reward' is and does.
B Tell me what 'punishment' is and does.
C "Rewards are more effective than punishment". Do you agree? yes / no.
D How sure are you that you could accurately explain 'operant conditioning'?
1 = certainly could, 5 = certainly could not.

(a) (i) Identify **one** closed question from A to D.

C ..... [1]

(ii) Identify **one** open question from A to D.

A ..... [1]

(b) (i) Pranit adds two new questions to his questionnaire:

E Do rewards increase or decrease the frequency of a behaviour?
increase / decrease.
F Explain the effect of punishment on the frequency of a behaviour.

Suggest **one** problem that Pranit could have when using **one** of the new questions.

Question E or F: ..... E

It is a closed question with only two options, so participants have a 50% chance of getting it right by guessing even if they do not understand operant conditioning, so it may not show a real difference between psychology students and the public. ..... [2]

(ii) Explain what the responses to Question E **and** Question F would tell Pranit about the participants' understanding of operant conditioning.

E It shows whether they understand that rewards act as positive reinforcement, which increases the frequency of a behaviour,

.....

F It shows whether they understand that punishment decreases the frequency of a behaviour, and how well they can explain why.

..... [2]

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8 Candy is investigating sleepiness in a student population. She is recording the number of hours' sleep the students have at the beginning and at the end of the year. She has identified two extraneous variables. One is a participant variable and one is a situational variable:

- Highly motivated students often work harder at the beginning of the year
- Late-night parties are more common at the end of the year.

(a) Explain which **one** of these is a participant variable.

Highly motivated students working harder, because motivation is a characteristic of the individual which differs between students. [1]

(b) Explain which **one** of these is a situational variable.

Late-night parties, because they are external, in the students' environment, and any student could go to them. [1]

(c) **(i)** Suggest how Candy could limit the effect of **either** the participant variable **or** the situational variable.

Situational variable: at the end of the year, give the students a questionnaire asking whether they went to any late-night parties that week, and remove those who did from the sample, so parties cannot reduce the hours of sleep recorded.

[2]

(ii) Attempting to limit the effects of one extraneous variable in a study can create other problem effects.

Suggest **one** problem that your answer to **(c)(i)** could create in Candy's study.
Do **not** refer to demand characteristics in your answer.

Students might lie on the questionnaire and not admit going to parties, e.g. if they are embarrassed, so Candy would think she had removed the party-goers when she had not, and their shorter sleep would still affect her results.

[2]

(d) Candy is also concerned about the effect of demand characteristics on her results.

(i) Suggest **one** way that demand characteristics could affect Candy's results.

Having their sleep recorded at the start of the year may make students guess the aim is about sleep changing over the year, so they may deliberately sleep more, or exaggerate how much they sleep, at the end of the year, making the results inaccurate. [2]

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(ii) Candy does not want to deceive her participants by giving them a false aim.

Suggest **one** way that Candy might reduce the effect of demand characteristics on her results, other than by giving her participants a false aim.

Hide the aim by adding filler questions to her questionnaire, e.g. about holidays,

hobbies and study habits, so it is not obvious that the study is about sleep.

.....

..... [2]

9 Vernon is conducting an observational study about the helping behaviour of students in a school.

(a) Vernon wants to use an opportunity sample but his teacher tells him that his sample will not be representative.

Explain what Vernon's teacher means, using an example relating to Vernon's study.

The sample would be biased and not typical of all the students in the school, so the results could not be generalised. For example, only the more helpful students may agree when Vernon asks them to take part.

..... [2]

(b) Vernon decides to use a random sample instead.

Suggest how Vernon could obtain a random sample of 50 participants.

Get a list of every student in the school from the registers and give each a number, then put all the numbers in a hat and draw out 50 (or use a random number generator).

..... [2]

(c) Vernon is planning how to observe and record helpful behaviour in the school.

(i) Suggest how **two** helping behaviours could be operationalised for Vernon's observation.

1 *Lending a pen or pencil to another student who does not have one.*

.....

2 *Carrying books or equipment for a teacher or another student.*

..... [2]

(ii) Suggest how Vernon could be a non-participant observer to collect data about helpful behaviour.

He would watch without joining in or interacting with the students, e.g. sitting at the back of the classroom or watching the corridor and playground through a window, and tally each helping behaviour he sees on a checklist.

..... [2]

Section C

Answer **all** questions in this section.

10 Meena wants to investigate one child in a class who is very resistant to authority and is sometimes very disobedient. Meena wants to study the child in detail to explore the child's behaviour.

(a) Describe how Meena could conduct a case study to investigate the behaviour of this child.

Meena would carry out a case study of the one child, e.g. a 9-year-old, who is very resistant to authority, over one school term, with consent from the parents and head teacher. The child would be identified only by initials to keep confidentiality.

Observation: a naturalistic, non-participant observation in the classroom and playground for 30 minutes a day, three days a week. Using time sampling every 30 seconds, she would tally behavioural categories for obedience, e.g. following a teacher's instruction within 10 seconds, and disobedience, e.g. ignoring an instruction, refusing ("No") or arguing back. She would also write qualitative notes on who gave the instruction and what happened just before.

Interviews: a semi-structured interview with the child, with open questions such as "How do you feel when a teacher tells you what to do?" and "Why do you sometimes not do what you are asked?", plus follow-up questions. She would also interview the class teacher and parents, e.g. "How does the child behave when asked to do homework?", to see if disobedience happens at home too.

Questionnaire: the child would rate statements from 1 (strongly disagree) to 5 (strongly agree), e.g. "I should always do what adults tell me."

Analysis: the tallies would be turned into the percentage of instructions obeyed in each setting and compared across the term, and interview answers analysed for themes, e.g. feeling treated unfairly. Triangulating the data from all methods gives a detailed picture of the child's disobedience.

.....

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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.

Meena alone decides whether each behaviour is disobedient, and because she already knows the child is "difficult", she may interpret unclear behaviour, such as being slow to start work, as disobedience (observer bias), so the data are less reliable and valid. To overcome this, a second observer who does not know why the child is being studied would observe at the same time using the same behavioural categories, and their tallies would be correlated; a strong positive correlation shows good inter-rater reliability.

..... [4]

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