EXPERIMENT: EXERCISE AND HAPPINESS

Design an experiment to investigate whether exercise could increase feelings of happiness. For your measure of happiness, you should devise a measure that would provide data suitable for testing at an ordinal level of measurement.

In your answer, you should provide details of:
- Design – include reference to experimental design, variables and controls
- Materials/Apparatus – describe any special materials required
- Data analysis that could be used – include reference to both descriptive and inferential analysis

Justify your choices.

[12 marks]

Design – Experimental design
For this experiment, an independent groups design will be used. An independent groups design will be appropriate in order to reduce order effects, in particular practice effects which could lead to demand characteristics, where the participants work out the aim of experiment: the effect of exercise on happiness.

Design – Variables
The independent variable is exercise (30 minutes exercise vs. no exercise) and the dependent variable is the change in happiness, measured via a questionnaire which will require participants to rate their happiness on a scale of 1-10 (with 1 being very unhappy and 10 being very happy) at the start and end of their condition. A change in happiness score will be calculated (ranging from -9 to +9), providing ordinal data.

Design – Controls
In order to control individual differences (e.g. existing levels of happiness) all participants will complete the questionnaire at the start and end of their condition. In condition one, participants will complete the questionnaire and be asked to wait in a waiting room for 30 minutes before completing it again. In condition two, participants will complete the questionnaire and then be asked to engage in 30 minutes of light exercise on a treadmill (walking or a slow jog), before completing the questionnaire again. All participants will complete the questionnaire in the waiting room to ensure that the room has no effect on their scores. To ensure time of day has no effect on scores, all participants will take part in the experiment in the morning (9 am to 11 am).

Materials/Apparatus
A questionnaire assessing happiness will be created, containing questions to obtain demographic information (age, gender, occupation, etc.) and the key question: how you would rate your current level of happiness on a scale of 1-10, with 1=very unhappy
and 10=very happy. A treadmill (in the PE department) will also be used in which the participants in condition two will be encouraged to set a brisk walking pace or slow jog. A waiting area (next to the PE department) will be used for participants in condition one and for all participants to complete their questionnaire at the start and end of their condition.

Data analysis
The data gathered will include a score for each of the participants ranging from -9 to +9 to indicate their change in happiness. For example:

<table>
<thead>
<tr>
<th>Condition 1 (No exercise) – Change in happiness score</th>
<th>Condition 2 (Exercise) – Change in happiness score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 0</td>
<td>11 4</td>
</tr>
<tr>
<td>2 0</td>
<td>12 5</td>
</tr>
<tr>
<td>3 -1</td>
<td>13 3</td>
</tr>
<tr>
<td>4 1</td>
<td>14 6</td>
</tr>
<tr>
<td>5 2</td>
<td>15 5</td>
</tr>
<tr>
<td>6 -2</td>
<td>16 0</td>
</tr>
<tr>
<td>7 1</td>
<td>17 0</td>
</tr>
<tr>
<td>8 0</td>
<td>18 5</td>
</tr>
<tr>
<td>9 1</td>
<td>19 6</td>
</tr>
<tr>
<td>10 -1</td>
<td>20 3</td>
</tr>
</tbody>
</table>

Descriptive statistics could include the median (the middle value in each condition) and range (calculated by subtracting the lowest value from the highest).

In terms of inferential analysis, a Mann Whitney U test will be appropriate as this is a test of difference between conditions, the data is at least an ordinal level of measurement and an independent groups design is used.

[Approx. 500 Words]

Examiner style comments: Mark Band 4

All the elements of the experiment has been presented and the suggestions are very well detailed, practical and appropriate for this experiment. The answer demonstrates clear knowledge and understanding of experimental design and data analysis and there is sufficient material for the study to be implemented.
EXPERIMENT: MUSIC AND TASK PERFORMANCE

Design an experiment using a repeated measures design that can be carried out in a classroom. The aim is to investigate whether listening to music affects task performance (e.g. while completing a word search or a spot the differences puzzle).

In your answer, you should provide details of:
- The operationalised IV, DV and controls
- The sample and the sampling technique
- The procedure that could be used – there should be enough detail for the study to be carried out

[12 marks]

Operationalised IV and DV

The independent variable is whether the participant listened to music (classical music with no lyrics) or not (silent condition) while completing a word search. The dependent variable is the time taken (in seconds) to find five words in a word search puzzle.

Controls

In order to control order effects (e.g. practice effects, which might make the participants complete the second word search faster) counterbalancing will be used: half of the participants will complete the first puzzle listening to music and the second puzzle in silence, and the other half will complete the first puzzle in silence and the second puzzle listening to music. This will be done using random allocation, meaning that any order effects will be balanced across both conditions. Participants will complete both parts of the task wearing noise cancelling headphones to ensure that they are in complete silence for the silent condition, and to ensure that wearing headphones is not a confounding variable. The same piece of classical music will be used for all participants as different pieces of music may affect levels of concentration. Two different word search puzzles with equal difficulty will be used. In order to select the two word search puzzles a range of puzzles will be completed by another group of people. The average time taken to complete the puzzles will be calculated and the two puzzles with the most similar times will be selected.

Sample and sampling technique

A sample of 20 sixth form students will be used for this experiment. They will be selected using a volunteer sampling method. A notice will be placed on the student notice board in a sixth form college asking for volunteers to take part in a psychology experiment to investigate factors that influence concentration. The first 20 participants to respond to the e-mail address provided will become the sample.

Procedure

The IV and DV have been clearly stated and operationalised.

Four different aspects of control have been outlined clearly and explained in relation to this experiment. The most important control is the counterbalancing as this is a repeated measures design.

An appropriate sample and sampling technique has been selected and justified.
Participants will be invited to a classroom at an allotted time between 9 am and 11 am. Materials used will be two word search puzzles, a pen, an iPod containing the classical music, and a set of headphones. They will be shown into the classroom, seated at a desk and given standardised instructions to read and a consent form to sign. The instructions will outline what will happen during the study: they will be completing two word search puzzles, either while listening music or in silence. When they have completed each puzzle, they should put down their pen to indicate that they have finished. They will then be asked to put on the headphones and adjust to a comfortable volume to suit their hearing.

If they are completing the music condition first, then the first puzzle will be given to them and the experimenter will switch on the music and begin timing using a stopwatch. When they put down their pen on the table, the experimenter will stop timing and switch the music off. They will then be given the second puzzle (to be completed in silence) and the experimenter will begin timing them. When they put their pen on the desk the experimenter will stop timing and they will be thanked and debriefed. If they are completing the silent condition first then the tasks will be the other way around.

[Approx. 500 Words]

Examiner style comments: *Mark Band 4*

*All the elements of the experiment has been presented and the suggestions are very well detailed, practical and appropriate for this experiment. The answer demonstrates clear knowledge and understanding of experimental design and there is sufficient material for the study to be implemented.*
**EXPERIMENT: WRITTEN AND SPOKEN INFORMATION**

Design an experiment to test whether people who are given written information remember more than people who hear information in a spoken form.

You must refer to/provide details of:
- Design – include reference to experimental design, variables and controls
- The sample and sampling technique
- Materials/Apparatus – describe any special materials required
- An outline of the proposed procedure

[12 marks]

**Design – Experimental design**

An independent groups design will be used. This will be appropriate in order to reduce order effects, in particular practice effects which will occur if people were given the same information twice – once in written form and again in spoken form.

**Design – Variables**

The independent variable is whether the information (a short story) is read out to the participants, or they read it for themselves. The dependent variable is the score out of 10 on a test of 10 questions in relation to the story.

**Design – Controls**

All the participants will be provided with the same story. The group hearing the story out loud will hear the same recording of someone reading the story. The participants reading the story for themselves will be provided with the story in the same font and size on white paper. All the participants will be given the same length of time to read the story, which will be determined by the length of the recording for the other condition (5 minutes). This is important as if the reading group have more time to process the information this could lead to an improvement in memory. Both groups will also be given the same amount of time (3 minutes) to answer the questions. Participants will be randomly allocated to the two conditions to try to ensure that any individual differences are balanced across the two conditions.

**The sample and sampling technique**

40 college students aged 16-18 will be used, 20 in each condition. They will be selected using an opportunity sampling method by being approached while in the college canteen and asked whether they will be willing to take part.

**Materials/Apparatus**

A novel short story (500 words) will be used. This will either be printed on paper or recorded on an iPod. A stopwatch will be used to time the group reading for themselves. A memory test made up of 10 questions will be required.
questions about the story will also be required. Standardised instructions will be produced to explain to the participants what they need to do.

Outline of possible procedure
The written information group will all be tested together. They will be seated in a classroom with two sheets of paper face down on the desk. Standardised instructions will be read out and they will be instructed to turn over the first sheet of paper and read the story while being timed for 5 minutes. They will then be told to put that sheet back on the desk face down and turn the second sheet over and answer the 10 questions. They will be allowed 3 minutes to do this before being thanked and debriefed.

The spoken information group will all be tested together. They will be seated in the same classroom with two sheets of paper face down on the desk. Standardised instructions will be read out and they will be instructed to turn over the first sheet of paper and the recording will begin. When the recording finishes, they will be told to put that sheet back on the desk face down and turn the second sheet over and answer the 10 questions. They will be allowed 3 minutes to do this before being thanked and debriefed.

[Approx. 500 Words]

Examiner style comments: Mark Band 4

All the elements of the experiment have been presented and the suggestions are very well detailed, practical and appropriate for this experiment. The answer demonstrates clear knowledge and understanding of experimental design and there is sufficient material for the study to be implemented.
QUASI-EXPERIMENT: MUSICAL ABILITY

Design a quasi-experiment to investigate whether there is a difference in the musical ability of left-handed students and right-handed students in a sixth form college.

You must provide details of:

- The experimental design
- An appropriate sampling method and justification
- The procedure that could be used, including details of how musical ability would be assessed
- A suitable debrief for the participants

[12 marks]

Experimental design
To control individual differences in this quasi-experiment, a matched pairs design would be used because repeated measures is not appropriate, as the participants can only be right- or left-handed. The participants could be matched in terms of gender and subjects studied. Once a left-handed participant has volunteered then a right-handed person of the same gender and who takes the same subjects could become their matched-pair.

Sampling method
Volunteer sampling would be used. Posters would be placed in the student social areas of a sixth form college asking for volunteers to contact the researcher by e-mail if they were interested in taking part in a study to investigate differences between right-handed and left-handed people. This would be an appropriate method as it might be difficult to find a sufficient number of left-handed participants using random or opportunity sampling methods.

Procedure
The participants would be individually invited to a classroom in the college at an allotted time. This would always be the same classroom and would be in a quiet area of the college so there would be no outside noise or other distractions. They would be asked to confirm whether they are right- or left-handed and it would be explained that one of the abilities being examined is musical ability and they would be required to sing. If they are happy with this, the same novel piece of music (one composed by the music teacher) would be played on a piano and sung by the music teacher and each participant would have to sing it back while the teacher played the tune on the piano. Their musical ability would then be rated on a scale of 1–10 by the music teacher (where 1 is extremely poor and 10 is extremely good). The participants would then be thanked and debriefed.

A suitable debrief
Thank you for taking part in this study. The specific aim of the research is to investigate whether there is a difference in the musical ability of left-handed students and right-handed students and this is

The experimental design has been outlined and explained.
Independent groups would also be appropriate but would not control individual differences.

An appropriate sampling method is clearly explained and justified.

The procedure is explained clearly and in sufficient detail for the study to be implemented.
An appropriate method to assess musical ability has been described that is the same for all students and also explains how it will be measured.

This debrief is written exactly as it
the only ability we will be testing today. This information could not be given at the beginning of the study as it may have affected your behaviour. Please be assured that your data will be completely confidential and not shared with anyone other than the research team. If you are unhappy with any aspects of the study, then you have the right to withdraw at this point and your results will be destroyed. Do you have any questions you would like to ask?

[Approx. 450 Words]

Examiner style comments: *Mark Band 4*

*All the elements of the experiment have been presented and the suggestions are very well detailed, practical and appropriate for this experiment. The answer demonstrates clear knowledge and understanding of experimental design and there is sufficient material for the study to be implemented.*
QUASI-EXPERIMENT: GENDER DIFFERENCES AND ATTENTION

Imagine that you have been asked to design a quasi-experiment to investigate whether there are gender differences in focused attention. You decide to ask participants to find a specific letter (e.g. ‘b’) in an array of different letters, as in this example, where the task is to find the ‘b’ in an array of ‘d’s.

```
d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d b d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
```

You decide to time the participants as they complete this task using a stopwatch. Discuss the following aspects of this investigation:

- With reference to the letter finding task, how you would ensure that the task is the same for all of the participants
- One methodological issue that needs to be taken into account when you obtain suitable participants for this study and explain how you would deal with this issue
- What you would do to ensure that your participants are treated ethically
- How you would use inferential statistics to analyse the results of this investigation

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you would...’ and therefore first person is highly appropriate for this question.

How would you ensure that the letter finding task is the same for all of the participants?
All of the participants would need to be given the same grid of letters, as a different grid could increase/decrease the difficulty. I would read a set of standardised instructions to each participant so that every participant understood the task. I would also give them a trial grid first to ensure that all the participants understood the task before they completed the experimental trial, as any uncertainty in the task might affect their ability to find the letter. I would also test all the participants at the same time of day (between 9 am and 11 am) as the letter finding task requires concentration and this might differ at different times of the day.

One methodological issue that needs to be taken into account when you obtain suitable participants for this study and explain how you would deal with this issue.
If someone had a job that involves reading through text to pick out errors (e.g. proofreading), or spends a lot of time completing similar puzzles, this could become a confounding variable as their time would be quicker regardless of gender. The only way to deal with this is to screen the participants before they take part by asking whether they spend a lot of time picking out errors in text (either because of

Three different ways of ensuring that the letter finding task is the same have been identified (same grids, standardised instructions and time of day). These have also been explained in terms of why it is important to keep them the same.

One methodological issue has been correctly identified and a practical explanation offered
their job or as a hobby). Only people who answered no to the question would be allowed to participate.

**What would you do to ensure that your participants are treated ethically?**

When I recruit the participants, I would gain informed consent and ask them to sign a consent form. I would explain that the study is investigating whether there are gender differences in focussed attention and that they would be required to look for the ‘odd one out’ in an array of letters. There would be no deception or withholding of information as I don’t think it would affect the validity of the findings to give this information at the beginning of the study. I would also explain that they have the right to withdraw during the study if they are unhappy with the experiment and that all their details would be kept confidential. Once they have taken part in the study I would thank the participants and debrief them by explaining the purpose of the research again and asking whether they were still happy for me to use their results. I would also offer them the opportunity to ask any questions.

**How you would use inferential statistics to analyse the results of this investigation?**

As data collected in this study is interval (ratio) level (time taken to find the letter), providing the data is drawn from a population with a normal distribution and the variance of the samples for males and females are not significantly different, I would use the unrelated t-test. This is because the data is ratio, the study is looking for a difference between the times taken by males and females, and uses an independent groups design (males in one group, females in the other). However, if the findings did not meet the requirements for a parametric test then I would use a Mann Whitney U test.

[Approx. 500 Words]

Examiner style comments: *Mark Band 4*

*Suggestions are well detailed and practical, showing sound understanding of the design of an experiment. All four elements are present. There is sufficient information for most aspects of the study to be implemented successfully. The answer is clear and coherent and specialist terminology is used effectively.*
OBSERVATION: MOBILE PHONE USE IN PUBLIC

Design a naturalistic observation study to investigate mobile phone use in a public place.

In your answer, you should provide details of:

- Where and when you will conduct the observation and how you will sample behaviour
- Which behavioural categories you will use and how you will record the data
- Graphical representation of the data
- How you will deal with ethical issues

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you will...’ and therefore first person is highly appropriate for this question.

Where and when you will conduct the observation and how you will sample behaviour
This will be a covert, non-participant observation. The observations will be carried out at Euston Station between the hours of 8 am and 10 am on a Monday. I will sit on a bench and observe the mobile phone use of people who pass directly in front of me. Event sampling will be used where all instances of mobile phone behaviour are recorded (see below).

Which behavioural categories you will use and how you will record the data
The behavioural categories I will use include: making a phone call; interacting with the phone but not making a call (e.g. text, using social media, etc.); and holding phone without interaction. I will collect this data using a tally sheet, as shown below. The total number of each behaviour could then be totalled and used to produce a graph.

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Tally</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making call</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacting with phone but not making call</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding phone but no interaction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graphical representation of the data
As this is nominal data (counting the number of instances of each behaviour using three categories) an appropriate graph is a bar chart as shown below:
Ethical issues to be considered
As the study is a covert observation in a busy station it will not be possible to gain informed consent from the participants and offer them the right to withdraw before taking part in the study. However, as the observation is taking place in a public place it does comply with ethical guidelines if privacy is not invaded, for example, listening into phone calls. While it would be too difficult to offer a debrief to all the participants, I will put up posters in the station following the observation explaining what the research entails and including my e-mail address so that people can contact me if they would like further information.

[Approx. 350 Words]

Examiner style comments: Mark Band 4

All the elements of the observation have been presented and the suggestions are very well detailed, practical and appropriate for this observation study. The answer demonstrates clear knowledge and understanding of these key features of an observation study and there is sufficient material for the study to be implemented.
OBSERVATION: DIFFERENCES IN NON-VERBAL BEHAVIOUR

Design a controlled observation to investigate differences in non-verbal behaviour (e.g. body language and gestures) of experts and non-experts who are required to give a presentation to an audience.

In your answer you should provide details of:

- The task for the participants and how you will decide who is an expert and who is not an expert
- Which behavioural categories you will use and how will you record the data
- How the reliability of data might be established
- Ethical issues to be considered

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you will decide...’ and therefore first person is highly appropriate for this question.

The task for the participants and how you will decide who is an expert and who is not an expert

For the task, I will ask participants to present a five-minute presentation on ‘Bowlby’s Theory of Attachment’ using PowerPoint slides that are already prepared. The experts will be psychology students from a sixth form college who have been taught Bowlby’s Theory. The non-experts will be non-psychology students from the same sixth form college. All the participants will be given 15 minutes to familiarise themselves with the slides. The audience will consist of two observers who are not known to any of the participants and the location will be a classroom in the college that none of the participants are familiar with.

Which behavioural categories you will use and how will you record the data

The behavioural categories I will use are hesitation (e.g. saying ‘um’ or ‘ah’, or stopping altogether), smiling, frowning and arm movements. These are all behaviours that might be shown by someone who is presenting. I will collect this data using a tally sheet, as shown below. The number of occurrences of each behaviour could then be totalled.

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Tally</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hesitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smiling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frowning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arm movements</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How the reliability of the data might be established

I will establish the reliability of the data by using two observers, to check for inter-observer reliability. I will operationalise the behavioural categories clearly and train the observers in how to use...
the tally sheet to record behaviour. Then I will get them both to observe someone giving the presentation and use a correlation test to determine how similar their scores were for each behaviour. If I found a correlation coefficient of .80 or more then I will know that there was a high level of reliability.

**Ethical issues to be considered**

As the study is conducted in a sixth form college the students will be old enough to give informed consent. They could be recruited using an opportunity sampling method and asked for their consent to take part in a study looking at non-verbal behaviour while giving a short presentation. However, full information regarding differences between experts and non-experts could not be given in advance of the presentation, as it could lead to demand characteristics.

Participants will be offered the right to withdraw at any point during the study and it will be explained that the data will be kept confidential. If anyone becomes anxious or upset while giving the presentation the observers will stop the presentation and provide them with the right to withdraw. When the presentation ends, each participant will be debriefed. The full purpose of the study (comparing the body language of experts and non-experts) will be explained. If the participants are not happy with the deception they will be allowed to withdraw their data. I will also offer the opportunity for participants to ask any questions.

[Approx. 500 Words]

**Examiner style comments:** *Mark Band 4*

*All the elements of the observation have been presented and the suggestions are very well detailed, practical and appropriate for this observation study. The answer demonstrates clear knowledge and understanding of these key features of an observation study and there is sufficient material for the study to be implemented.*
OBSERVATION: HEALTHY BREAKFAST

An experienced primary school teacher believes that children who eat ‘a healthy breakfast’ learn to read more quickly and are better behaved than children who eat an unhealthy breakfast. Imagine that you have been asked to design an observational study to see whether eating a healthy breakfast affects behaviour in the playground.

Include in your answer sufficient detail to allow reasonable replication of the study. You must provide details of:
- The directional hypothesis that you intend to test and how you will operationalise the Independent Variable (IV)
- Which behavioural categories you will use and how you will record the data
- How you will increase the validity of your observations
- How you will deal with ethical issues

[12 marks]

The directional hypothesis
Children who do not eat a healthy breakfast will carry out more aggressive behaviours (e.g. hitting, kicking and pushing) in the school playground during morning break than children who eat a healthy breakfast.

Operationalisation of the IV
I will operationalise the IV by defining what constitutes an unhealthy breakfast and a healthy breakfast. For an unhealthy breakfast this could include: sugary cereals, white toast or a fried breakfast; and for a healthy breakfast this could include: oats, fruit, yogurt, etc.

Which behavioural categories you will use and how will you record the data
As the DV is the number of aggressive behaviours shown, the behavioural categories I will use are hitting, kicking and pushing. These are all examples of physical aggression. I will collect this data using a tally sheet, as shown below. The number of each behaviour could then be totalled. In order to conduct the observations, it will be necessary to know which child has eaten which type of breakfast so that they can be asked when they come into school in the morning and then they can be given a different colour sports vest to wear at break – red for a healthy breakfast and green for a non-healthy breakfast.

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Tally red</th>
<th>Tally green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kicking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pushing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How you will increase the validity of your observation
I will ensure that the observer can clearly identify who is in each group (see above), to ensure that they are observing and tallying the
behaviour for each group correctly. In addition, if the observer knows what the difference between the two groups was this might lead to observer bias as they could perceive the behaviours shown by the non-healthy breakfast group as being more aggressive. Therefore, I will increase the validity by using a double-blind control where neither the children nor the observer know the aim of the study.

Ethical issues to be considered
As the study involves observing children, parental consent needs to be obtained. The school could write to the parents of one of the classes in the primary school and ask for their consent to carry out a study into the effects of healthy eating which will involve their child being asked some questions about the foods they eat and being observed for a short time while playing in the playground. If a parent refused then their child will not be included in the study.

To prevent the children becoming upset by a stranger watching them in the playground, one of the other teachers in the school who is not aware of the aims of the study could be trained to do the observations.

None of the children should be identified by name in the report of the investigation and neither should the school. This is to ensure confidentiality and anonymity.

[Approx. 450 Words]

Examiner style comments: Mark Band 4

All of the elements of the observation have been presented and the suggestions are very well detailed, practical and appropriate for this observation study. The answer demonstrates clear knowledge and understanding of these key features of an observation study and there is sufficient material for the study to be implemented.
CORRELATION: CAKE CONSUMPTION AND HAPINESS

Design a study to investigate whether there is a correlation between cake consumption and levels of happiness in students.

You must refer to:
- Your target population, sample and sampling technique
- How you would operationalise the co-variables
- The control of at least one extraneous variable
- How you would present the data in a graph

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you would...’ and therefore first person is highly appropriate for this question.

Target population, sample and sampling technique
The target population for this study is A-level students aged 16–18. The sample size would be 20, and they would be obtained through a volunteer sampling method to fulfil a quota of 10 males and 10 females and to ensure a range of different subjects are being taken. I would place a poster in the common room of my sixth form college asking for people to e-mail me if they would like to take part in a study investigating the relationships between food and mood. I would also ask for people to tell me what A-level subjects they are currently studying.

I would then send a link to my questionnaire to 10 males and 10 females, ensuring that they take a range of subjects.

Operationalisation of the co-variables
The two co-variables are happiness and cake consumption. I would send each participant a link to a questionnaire including questions about their mood and how often they eat certain types of food. Only the two questions on happiness and cake consumption would be analysed. Happiness would be operationalised by asking the participants to rate how happy they feel on a scale of 1–10, where 10 is extremely happy and 1 is extremely unhappy. Cake consumption would be operationalised by asking the participants to state how many individual cakes or portions of cake they have eaten in the last week.

Control of at least one extraneous variables
Having additional distractor questions in the questionnaire should prevent participants from guessing the purpose of the research and therefore reduce demand characteristics. I would ensure that the students take a range of subjects and do not all take the same A-level subject (e.g. psychology), as the subjects taken may influence the happiness rating. I would also ensure that 10 participants are male and 10 are female as gender may have an influence on happiness.
and/or cake consumption. Once they have completed the questionnaire I would send all the participants an e-mail thanking them for taking part and explaining the true aim of the study. I would also explain that their data would be confidential and that they have the right to withdraw their data until publication.

**How you would present the data on a graph**

Once I have received all the responses, I would make a table of results, as shown below:

<table>
<thead>
<tr>
<th>Participant no.</th>
<th>Happiness rating (out of 10)</th>
<th>No. of individual cakes portions of cake eaten in the past week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I would then plot the sets of scores for the two co-variables on a Scattergram, as shown below, and look to see if the graph shows a linear relationship (positive or negative correlation).

While it is not necessary to produce a whole table of results, this helps to show how the results would be recorded in order for the graph to be plotted.

[Approx. 420 Words]

**Examiner style comments:** *Mark Band 4*

All the elements of the correlation study have been presented and the suggestions are very well detailed, practical and appropriate for this investigation. The answer demonstrates clear knowledge of correlation design and graphical representation of the data and there is sufficient material for the study to be implemented.
CORRELATIONAL STUDY: COFFEE CONSUMPTION AND MEMORY

Imagine that you have been asked to design a correlation study to see if there is a relationship between the number of cups of coffee students drink and their performance on a memory test. Discuss the following aspects of this investigation:

- How you would test memory and how would you ensure this was the same for all participants
- How you would operationalise the second co-variable and control at least one other extraneous variable (i.e. one not related to the test of memory)
- How you would deal with ethical issues
- How you would use inferential statistics to analyse the results of this investigation

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you would…’ and therefore first person is highly appropriate for this question.

How you would test memory and how would you ensure this was the same for all participants
I would give all the participants 20 words to learn. These would be presented on a computer screen at a rate of one word every second. The participants would then be given five mental arithmetic problems to solve (also using the computer). Once they complete this, I would give each participant three minutes to recall as many of the 20 words as they can, in any order. All of the participants would be given the same words, the same standardised instructions and the same distractor task, to ensure that none of these variables could affect performance.

How you would operationalise the second co-variable and control at least one other extraneous variable
I would ask each participant how many cups of coffee containing caffeine they had drunk in the last 24 hours. I would also make sure that they did not count cups of decaffeinated coffee as this might not have the same effect on memory. I would also need to ensure that participants had not taken caffeine in any other form during the last 24 hours (e.g. energy drinks or painkillers containing caffeine, etc.).

How you would deal with ethical issues
My participants would be 16–18-year-old students in a sixth form college and therefore they would be able to provide informed consent. I would use an opportunity sample, and when I approached potential participants I would explain that the study is examining the relationship between memory and caffeine consumption, which would involve learning a list of words. Providing the participants with this information would allow them to provide fully informed consent. I would also explain that their data would remain confidential and that they would have the right to withdraw at any time. Once I have collected the information on the number of cups of coffee they had drunk, and the participants had completed the memory test, I would thank them and debrief them by explaining the aims of the research.
in more detail. If they were unhappy with anything about the study I would allow them to withdraw their data. I would also ask if they had any questions.

**How you would use inferential statistics to analyse the results of this investigation**
I would use a Spearman’s Rho to analyse the results because the data is at least ordinal and the study is looking for a correlation between memory and the number of cups of coffee drunk. The Pearson’s R test is also a correlation test but is not appropriate for this investigation as the sample is students who do not come from a population with a normal distribution and the memory scores are ordinal rather than interval data as not all of the words on the list would be of equal difficulty. The test would provide the correlation coefficient which would tell us the strength and the direction of the relationship.

[Approx. 420 Words]

Examiner style comments: *Mark Band 4*

Suggestions are well detailed and practical, showing sound understanding of design of correlation study. All four elements are present. There is sufficient information for most aspects of the study to be implemented with success. The answer is clear and coherent and specialist terminology is used effectively.
SELF-REPORT: MEMORY IMPROVEMENT TECHNIQUES AND REVISION

Explain how you would carry out a self-report study using a questionnaire to investigate the effectiveness of memory improvement techniques used by students while revising.

You must refer to/provide details of:
- Your target population, sample and sampling technique
- Open and closed questions
- How you would assess the reliability of the questionnaire
- The use of a pilot study

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you would…’ and therefore first person is highly appropriate for this question.

The target population, sample and sampling technique
The target population for this study is A-level students who are 16–18 years old. As this study is utilising a questionnaire, I can use a large sample of 100 students who would be obtained through an opportunity sampling method. I would go into the college social areas and library to hand out the questionnaires and wait nearby while the students complete them. This should help to ensure a high response rate.

Open and closed questions
As this study is using a self-completion questionnaire, I need to ensure that the questionnaire is quick and easy to fill in, so that the respondents do not get bored and fail to complete it. Therefore, I would mostly use closed questions which could include rating and Likert scales. For example, I would include a list of different types of memory improvement techniques students might use when revising (e.g. use of mind maps, mnemonics, etc.) and ask the students to indicate how effective they find each technique on a scale of 1–5, where 5 is very effective and 1 is very ineffective. I would also use closed questions to collect demographic data such as age, gender and subjects studied. In addition, I would also include a small number of open questions to collect some qualitative data. For example, I would ask ‘Which technique do you find most effective and why?’

How you would assess the reliability of the questionnaire
I would use the test-retest method to assess the reliability of the questionnaire. This would involve giving the questionnaire to a small number of students on two occasions with a time in between (e.g. one week). I could then check that their responses where the same (or very similar) on both occasions to ensure the questionnaire is reliable. If it isn’t then I would need to modify the questionnaire and assess the reliability again.

A clear understanding of the difference between open and closed questions is show. The answer has clearly explained, using examples, how both would be appropriate in this study.

This is an appropriate way to assess the reliability of a questionnaire.
**Use of a pilot study**

I would use a pilot study by giving the first version of my questionnaire to a small sample of five students from the target population to make sure that they understand the questions. I can also check that I am gaining the information that I require for this study. Once the students have completed the questionnaire, I would ask them questions regarding how easy or difficult they found it to fill in, or whether there were any specific questions they found difficult. Based on the student’s responses I would make any necessary modifications to the questionnaire then assess the reliability using the test-retest method outlined above before conducting the main study.

[Approx. 400 Words]

Examiner style comments: *Mark Band 4*

*Suggestions are well detailed and practical, showing sound understanding of the design of a self-report study using a questionnaire. All four elements are present. There is sufficient information for most aspects of the study to be implemented with success. The answer is clear and coherent and specialist terminology is used effectively.*

This student clearly understands what a pilot study is and how it could be used in this investigation.
SELF-REPORT: GENDER DIFFERENCES IN ANOREXIA TREATMENT

Imagine that you are a psychologist who wanted to find out why females respond better than males to a new treatment for anorexia. Explain how you would carry out a self-report investigation using an interview.

You must refer to/provide details of:

- The sample and the sampling technique
- How you would reduce investigator effects such as interviewer bias
- Examples of questions that would collect qualitative data and how this data would be analysed.
- How you would deal with ethical issues

Please note: This answer has been written in the first person as that question states: ‘how you would...’ and therefore first person is highly appropriate for this question.

Sample and sampling technique
A sample of five males and five females will be recruited as this study will collect in-depth data using semi-structured interviews. An opportunity sampling method will be used, as the interviews will involve people who have been taking part in a new treatment for anorexia. I will ask the doctors conducting the treatment to approach their patients and ask if they are willing to take part.

Reducing investigator effects such as interviewer bias
As the interviews will be semi-structured, a series of standardised questions will be included that all of the participants are asked in the same way. I will ensure that the interviewer avoids using any leading questions which could bias the participants’ answers. The study will use a double-blind procedure, as I will not conduct the interviews myself so that neither the participant nor the interviewer is aware of the aim of the research: to see why females respond better to the treatment than males.

Examples of questions that would collect qualitative data and how this data would be analysed
Examples of appropriate questions are:
- What do you like about this treatment method?
- What do you dislike about this treatment method?
- Which aspects of the treatment do you feel work the best?

I will analyse the responses to these questions using content analysis. For example, I will go through the responses to each question and pick out categories such as ‘It does not require much effort’ or ‘It has helped me to eat more’. When I have a list of categories, I will go through the responses and count the frequency of each response using a tally chart – one for males and one for females. Using this method, I could convert the qualitative data to quantitative data and compare the responses of the males and females.
Ethical issues
When the participants agree to take part in the study they will be provided with a consent form to read and sign. This will explain that the aim of the study is to investigate their views about the anorexia treatment they are having. They will be told that their information will remain confidential and even the doctor who is treating them will not know what has been discussed. This will also be stressed at the beginning of the interview, where it will also be explained that they have the right to refuse to answer any question they are not comfortable with and are free to withdraw at any point during the interview. The interviewer will also monitor the behaviour of the respondents during the interviews to make sure that they are not distressed. If they appear to be distressed then the interview will be terminated. This is very important as participants in this sample are vulnerable due to their eating disorder. At the end of the interview they will be thanked for their time and debriefed by being provided with a more detailed explanation of the aim, as it will be better to not provide information about gender differences at the beginning, as it could lead to demand characteristics. If any of the participants are not happy when told the full aim, then they will be allowed to withdraw their findings from the study.

Approx. 500 Words

Examiner style comments: Mark Band 4

All the elements of the self-report study have been presented and the suggestions are very well detailed, practical and appropriate for this investigation. The answer demonstrates clear knowledge of the interview method and the analysis of qualitative data and there is sufficient material for the study to be implemented.
CASE STUDY: BULLYING

You are a psychologist who is interested in how experiences of being bullied as a child affect a person’s adult behaviour and relationships. You want to use a case study approach to gain an in-depth understanding. Explain how you would conduct a case study to investigate this.

You must refer to/provide details of:

- At least two different ways you could collect data
- How you would obtain your sample
- How you would deal with ethical issues
- How you could reduce investigator effects

[12 marks]

Please note: This answer has been written in the first person as that question states: ‘how you would ...’ and therefore first person is highly appropriate for this question.

Two ways you could collect data
A case study involves conducting a detailed study of a single individual (or group), so I could collect data by conducting a series of unstructured interviews with one participant to find out about their childhood experiences of being bullied and how they feel that has affected their adult behaviours and experiences. I could also conduct unstructured interviews with their parents to find out more information about how they were bullied as a child. It would also be useful to interview a close friend or partner of the participant to find out more information about their behaviour and relationships.

A second method I could use to collect data is an overt observation of the participant when they are interacting with friends or relatives, to assess the nature of their interactions. This would be a structured observation and I would produce a checklist of behaviours based on the information gathered in the interviews. Possible examples of behaviours might be ‘making eye-contact’, ‘hugging’, ‘resisting affection from others’, etc.

How to obtain sample
As I need to find a participant who was bullied as a child, and this is a very in-depth investigation, it would be best to use a volunteer sample. I could place an advert on social media (e.g. Facebook groups in my local area) asking for people who were bullied as a child to volunteer to take part in an in-depth study.

Ethical issues
I would need to gain informed consent from the participant by explaining the aim of the study and what taking part would involve. They would be told that it would involve a series of in-depth interviews (with themselves and others) and some observations of their behaviour. I would have to reassure them that anything they told me would remain confidential and that when I published my

Two appropriate methods to collect data have been identified and explained.

This is an appropriate sampling technique for this study and it has been explained and justified clearly.
research it would not include their name or any other personal information that might identify them. They would also be offered the right to withdraw from the study at any point and told that they can refuse to answer any questions. The same would apply to any other people interviewed as part of the case study.

If the person became upset during the interview(s) then I would stop the interview. I would also advise them to seek counselling if I believed that the bullying was having a negative effect on their mental health.

Reducing investigator effects
As the interviews are unstructured, I would need to be very careful to avoid any leading questions that might suggest how the bullying might have affected their behaviour and relationships. Due to the in-depth nature of the study, I would need to conduct the interviews myself. However, for the structured observation I would use an observer who did not know the aims of the research to reduce observer bias.

[Approx. 500 Words]

Examiner style comments: Mark Band 4

All of the required elements of the case study have been presented and the suggestions are very well detailed, practical and appropriate for this experiment. The answer demonstrates clear knowledge and understanding of the case study method and there is sufficient material for the study to be implemented.
EXPERIMENT: EXERCISE AND HAPPINESS

Design an experiment to investigate whether exercise could increase feelings of happiness. For your measure of happiness, you should devise a measure that would provide data suitable for testing at an ordinal level of measurement.

In your answer, you should provide details of:
- Design – include reference to experimental design, variables and controls
- Materials/Apparatus – describe any special materials required
- Data analysis that could be used – include reference to both descriptive and inferential analysis

Justify your choices. [12 marks]

EXPERIMENT: MUSIC AND TASK PERFORMANCE

Design an experiment using a repeated measures design that can be carried out in a classroom. The aim is to investigate whether listening to music affects task performance (e.g. while completing a word search or a spot the differences puzzle).

In your answer, you should provide details of:
- The operationalised IV, DV and controls
- The sample and the sampling technique
- The procedure that could be used – there should be enough detail for the study to be carried out

[12 marks]

EXPERIMENT: WRITTEN AND SPOKEN INFORMATION

Design an experiment to test whether people who are given written information remember more than people who hear information in a spoken form.

You must refer to/provide details of:
- Design – include reference to experimental design, variables and controls
- The sample and sampling technique
- Materials/Apparatus – describe any special materials required
- An outline of the proposed procedure

[12 marks]
### QUASI-EXPERIMENT: MUSICAL ABILITY

Design a quasi-experiment to investigate whether there is a difference in the musical ability of left-handed students and right-handed students in a sixth form college.

You must provide details of:
- The experimental design
- An appropriate sampling method and justification
- The procedure that could be used, including details of how musical ability would be assessed
- A suitable debrief for the participants

[12 marks]

### QUASI-EXPERIMENT: GENDER DIFFERENCES AND ATTENTION

Imagine that you have been asked to design a quasi-experiment to investigate whether there are gender differences in focussed attention. You decide to ask participants to find a specific letter (e.g. ‘b’) in an array of different letters, as in this example, where the task is to find the ‘b’ in an array of ‘d’s.

```
d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d b d d d d d d d
  d d d d d d d d d d d d d d d d d
  d d d d d d d d d d d d d d d d d
```

You decide to time the participants as they complete this task using a stop watch. Discuss the following aspects of this investigation:
- With reference to the letter finding task, how you would ensure that the task is the same for all of the participants
- One methodological issue that needs to be taken into account when you obtain suitable participants for this study and explain how you would deal with this issue
- What you would do to ensure that your participants are treated ethically
- How you would use inferential statistics to analyse the results of this investigation

[12 marks]

### OBSERVATION: MOBILE PHONE USE IN PUBLIC

Design a naturalistic observation study to investigate mobile phone use in a public place.

In your answer, you should provide details of:
- Where and when you will conduct the observation and how you will sample behaviour
- Which behavioural categories you will use and how you will record the data
- Graphical representation of the data
- How you will deal with ethical issues

[12 marks]
**OBSERVATION: DIFFERENCES IN NON-VERBAL BEHAVIOUR**

Design a controlled observation to investigate differences in non-verbal behaviour (e.g. body language and gestures) of experts and non-experts who are required to give a presentation to an audience.

In your answer you should provide details of:
- The task for the participants and how you will decide who is an expert and who is not an expert
- Which behavioural categories you will use and how will you record the data
- How the reliability of data might be established
- Ethical issues to be considered

[12 marks]

**OBSERVATION: HEALTHY BREAKFAST**

An experienced primary school teacher believes that children who eat ‘a healthy breakfast’ learn to read more quickly and are better behaved than children who eat an unhealthy breakfast. Imagine that you have been asked to design an observational study to see whether eating a healthy breakfast affects behaviour in the playground.

Include in your answer sufficient detail to allow reasonable replication of the study. You must provide details of:
- The directional hypothesis that you intend to test and how you will operationalise the Independent Variable (IV)
- Which behavioural categories you will use and how you will record the data
- How you will increase the validity of your observations
- How you will deal with ethical issues

[12 marks]

**CORRELATION: CAKE CONSUMPTION AND HAPPINESS**

Design a study to investigate whether there is a correlation between cake consumption and levels of happiness in students.

You must refer to:
- Your target population, sample and sampling technique
- How you would operationalise the co-variables
- The control of at least one extraneous variable
- How you would present the data in a graph

[12 marks]
CORRELATIONAL STUDY: COFFEE CONSUMPTION AND MEMORY

Imagine that you have been asked to design a correlation study to see if there is a relationship between the number of cups of coffee students drink and their performance on a memory test. Discuss the following aspects of this investigation:

- How you would test memory and how would you ensure this was the same for all participants
- How you would operationalise the second co-variable and control at least one other extraneous variable (i.e. one not related to the test of memory)
- How you would deal with ethical issues
- How you would use inferential statistics to analyse the results of this investigation

[12 marks]

SELF-REPORT: MEMORY IMPROVEMENT TECHNIQUES AND REVISION

Explain how you would carry out a self-report study using a questionnaire to investigate the effectiveness of memory improvement techniques used by students while revising.

You must refer to/provide details of:

- Your target population, sample and sampling technique
- Open and closed questions
- How you would assess the reliability of the questionnaire
- The use of a pilot study

[12 marks]

SELF-REPORT: GENDER DIFFERENCES IN ANOREXIA TREATMENT

Imagine that you are a psychologist who wanted to find out why females respond better than males to a new treatment for anorexia. Explain how you would carry out a self-report investigation using an interview.

You must refer to/provide details of:

- The sample and the sampling technique
- How you would reduce investigator effects such as interviewer bias
- Examples of questions that would collect qualitative data and how this data would be analysed.
- How you would deal with ethical issues

[12 marks]

CASE STUDY: BULLYING

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You must refer to/provide details of:

- At least two different ways you could collect data
- How you would obtain your sample
- How you would deal with ethical issues
- How you could reduce investigator effects

[12 marks]