Experimental Methods – Questions by Topic

Q1.

Read the item and then answer the questions that follow.

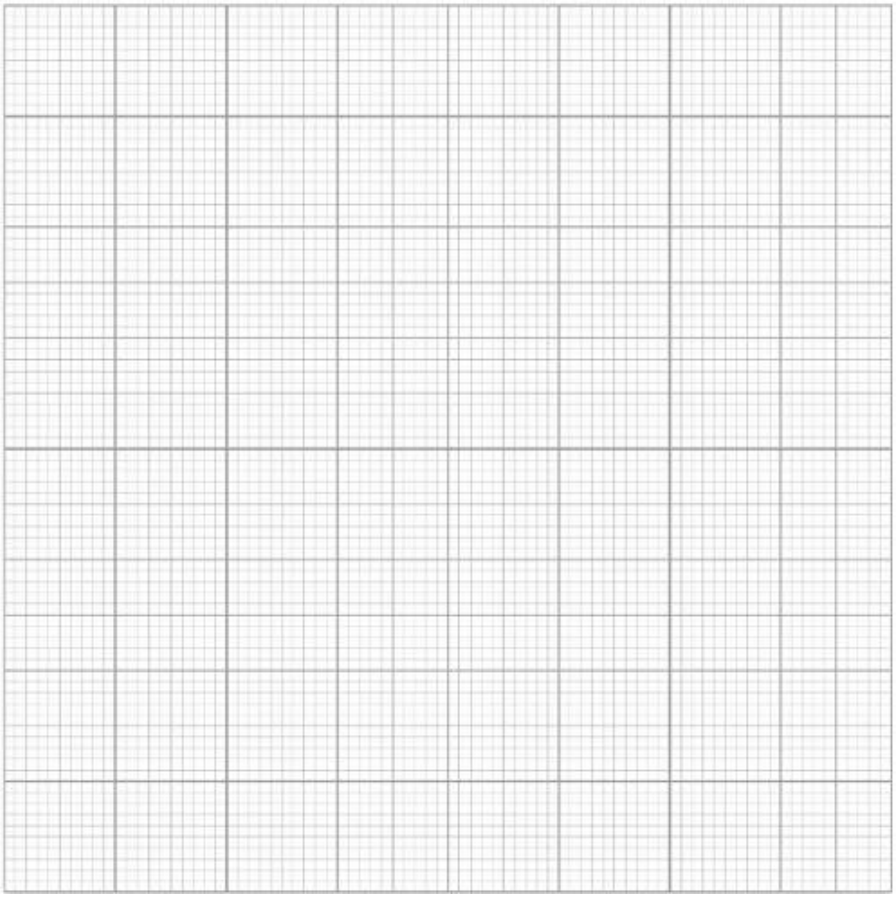
Participants in an experiment were shown a film of a robbery. The participants were then divided into two groups. One group was interviewed using a standard interview technique and the other group was interviewed using the cognitive interview technique. All participants were then given an 'accuracy score' (out of 20) based on how closely their recall matched the events in the film (20 = completely accurate, 0 = not at all accurate).

The results of the experiment are shown in the table below.

The median accuracy score for the standard interview and the cognitive interview

	Standard interview	**Cognitive interview**
Median	10	15

(a) Sketch an appropriate graphical display to show the median accuracy scores in the table above.



(6)

(b) The experiment used an independent groups design.

Explain how this study could have been modified by using a matched pairs design.

(4)

(Total 10 marks)

Q2.

Read the item and then answer the questions that follow.

A psychologist wanted to see if creativity is affected by the presence of other people. To test this he arranged for 30 people to participate in a study that involved generating ideas for raising funds for a local youth club. Participants were randomly allocated to one of two conditions.

Condition A: there were 15 participants in this condition. Each participant was placed separately in a room and was given 40 minutes to think of as many ideas as possible for raising funds for a local youth club. The participant was told to write down his or her ideas and these were collected in by the psychologist at the end of the 40 minutes.

Condition B: there were 15 participants in this condition. The participants were randomly allocated to 5 groups of equal size. Each group was given 40 minutes to think of as many ideas as possible for raising funds for a local youth club. Each group was told to write down their ideas and these were collected by the psychologist at the end of the 40 minutes.

The psychologist counted the number of ideas generated by the participants in both conditions and calculated the total number of ideas for each condition.

Total number of ideas generated in Condition A (when working alone) and in Condition B (when working in a group)

	Condition A Working alone	**Condition B Working in a group**
Total number of ideas generated	110	75

(a) Identify the experimental design used in this study **and** outline **one** advantage of this experimental design.

(3)

(b) Describe **one other** experimental design that researchers use in psychology.

(2)

(c) Apart from using random allocation, suggest **one** way in which the psychologist might have improved this study by controlling for the effects of extraneous variables. Justify your answer.

(2)

(d) Write a suitable hypothesis for this study.

(3)

(e) From the information given in the description, calculate the number of participants in each group in Condition B.

(1)

Read the item and then answer the questions that follow.

> The psychologist noticed that the number of ideas generated by each of the individual participants in **Condition A** varied enormously whereas there was little variation in performance between the 5 groups in **Condition B.** He decided to calculate a measure of dispersion for each condition.

(f) Name a measure of dispersion the psychologist could use.

(1)

(g) The psychologist uses the measure of dispersion you have named in your answer to **question (f)**. State how the result for each condition would differ.

(1)

(h) Explain how the psychologist could have used random allocation to assign the 15 participants in **Condition B** into the 5 groups.

(3)

(i) Using the information given in the table above, explain how the psychologist could further analyse the data using percentages.

(2)

(j) At the end of the study the psychologist debriefed each participant. Write a debriefing that the psychologist could read out to the participants in **Condition A.**

(6)

(Total 24 marks)

Q3.

Read the item and then answer the questions that follow.

Twenty primary school teachers were sent by their individual head teachers to attend a training course in classroom behaviour management run by educational psychologists at a local university. Before the training course, and again after training, the teachers were asked to say how confident they were in managing difficult classroom behaviour.

The researchers compared the before and after answers to see how many teachers rated their confidence as 'better', 'worse', or 'the same' as it had been at the start of the course.

The results are shown in the table below:

	Confidence Better	**Confidence Worse**	**Confidence Same**
Number of teachers	16	2	2

(a) Which of A, B, C or D best describes this study?

A laboratory experiment

B pilot experiment

C natural experiment

D controlled experiment

(1)

(b) What fraction of the teachers thought that their confidence was better after the course? Show your workings.

(2)

(c) What might the researchers conclude about the training course on the basis of the data in the table? Explain your answer.

(2)

(d) What is the operationalised dependent variable in this study?

(2)

(e) Which experimental design is being used in this study and why would it be an appropriate design in this case?

(3)

(f) The psychologists conducting the training decided to use the Sign Test to see whether there was a significant difference in confidence in managing difficult classroom behaviour before and after the course.

Give the calculated value of S in this study and explain how you arrived at this figure.

(3)

(g) Explain why statistical testing is used in psychological research.

(2)

(h) Following the training course, one of the researchers carried out an overt classroom observation of each teacher's primary school class. The researcher wanted to record the frequency of difficult classroom behaviours shown by the pupils during a normal lesson.

He identified six categories of disruptive behaviour and decided to record the frequency of each of the six behaviours during the first ten minutes and the last ten minutes of the lesson.

Suggest **two** behavioural categories that the researcher could record during his observation.

(2)

(i) Design a tally chart/record sheet the researcher could use to record his observations.

Show your tally chart/record in the box below.

(3)

(j) Identify **one** problem that might have occurred during this observation and explain how the observation would be improved by addressing this problem.

(4)

(Total 24 marks)

Q4.

Read the item and then answer the questions that follow.

A psychologist wanted to see if verbal fluency is affected by whether people think they are presenting information to a small group of people or to a large group of people.

The psychologist needed a stratified sample of 20 people. She obtained the sample from a company employing 60 men and 40 women.

The participants were told that they would be placed in a booth where they would read out an article about the life of a famous author to an audience. Participants were also told that the audience would not be present, but would only be able to hear them and would not be able to interact with them.

There were two conditions in the study, **Condition A** and **Condition B**.

Condition A: 10 participants were told the audience consisted of 5 listeners.

Condition B: the other 10 participants were told the audience consisted of 100 listeners.

Each participant completed the study individually. The psychologist recorded each presentation and then counted the number of verbal errors made by each participant.

(a) Identify the dependent variable in this study.

(2)

(b) Write a suitable hypothesis for this study.

(3)

(c) Identify **one** extraneous variable that the psychologist should have controlled in the study **and** explain why it should have been controlled.

(3)

(d) Explain **one** advantage of using a stratified sample of participants in this study.

(2)

(e) Explain how the psychologist would have obtained the male participants for her stratified sample. Show your calculations.

(3)

(f) The psychologist wanted to randomly allocate the 20 people in her stratified sample to the two conditions. She needed an equal number of males in each condition and an equal number of females in each condition. Explain how she would have done this.

(4)

(Total 17 marks)

Q5.

Dave, a middle-aged male researcher, approached an adult in a busy street. He asked the adult for directions to the train station. He repeated this with 29 other adults.

Each of the 30 adults was then approached by a second researcher, called Sam, who showed each of them 10 photographs of different middle-aged men, including a photograph of Dave. Sam asked the 30 adults to choose the photograph of the person who had asked them for directions to the train station.

Sam estimated the age of each of the 30 adults and recorded whether each one had correctly chosen the photograph of Dave.

(a) Identify **one** aim of this experiment.

(2)

(b) Suggest **one** reason why the researchers decided to use a field experiment rather than a laboratory experiment.

(2)

(c) Name the sampling technique used in this experiment. Evaluate the choice of this sampling technique in this experiment.

(4)

(d) Identify **one** possible extraneous variable in this experiment. Explain how this extraneous variable could have affected the results of this experiment.

(4)

(Total 12 marks)

Q6.

Research has shown that music can affect the ability to concentrate. Design an experiment that could be carried out in a classroom to test the effects of two different kinds of music on a task requiring concentration (e.g. word search).

You **must** use a repeated measures design.

In your answer you should:

- fully operationalise the independent and dependent variables
- provide details of how you would control extraneous variables
- describe the procedure that you would use. You should provide sufficient detail for the study to be carried out.

(Total 10 marks)

Q7.

A psychologist wanted to investigate whether or not the presence of an audience had an effect on the performance of a task.

The task was to shoot netballs through a hoop. Each participant took 20 shots.

The experiment took place in a school sports hall.

The psychologist obtained the sample of participants from a local secondary school for girls. She drew the names of 40 participants at random from a list of girls who all played netball regularly. The first 20 participants drawn took part in the experimental condition and the next 20 participants took part in the control condition.

In the experimental condition, each participant took 20 shots. In this condition, 50 pupils from the school acted as an audience watching the performance.

In the control condition, the other 20 participants performed the same task, but this time without the audience watching.

The psychologist observed each girl's performance and recorded the number of netballs successfully shot through the hoop.

(a) State an appropriate hypothesis for this study.

(2)

The results of the study are shown in the table below.

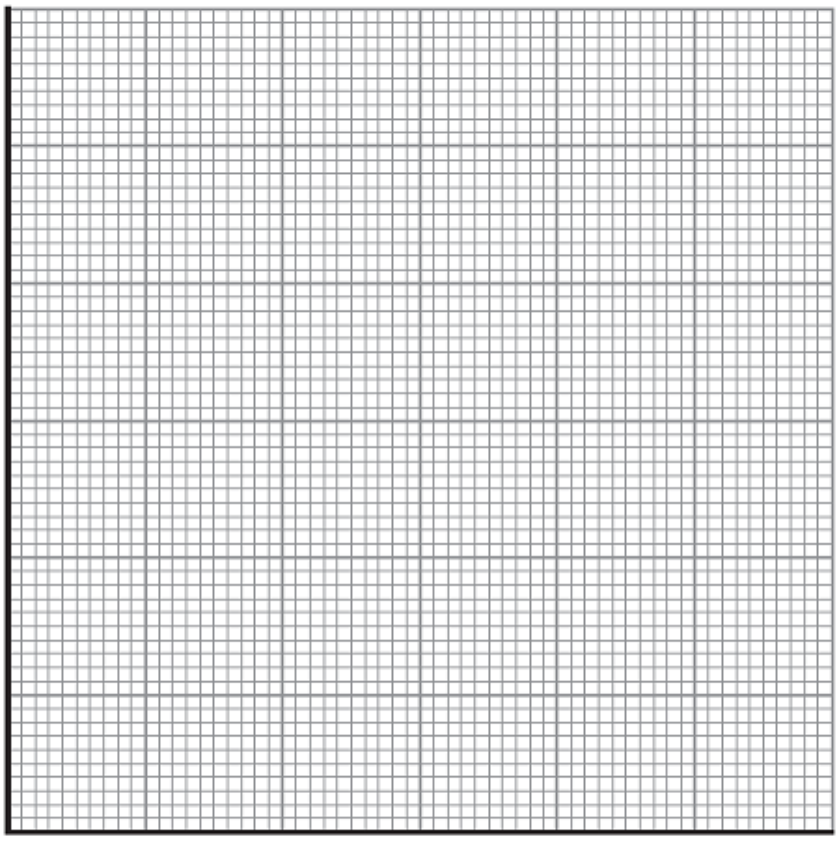
The mean number of netballs successfully shot through the hoop in the presence and absence of an audience.

	Mean number of netballs successfully shot through the hoop
Presence of an audience	15
Absence of an audience	9

(b) What might the psychologist conclude from the data in the table above? Justify your answer.

(2)

(c) Sketch an appropriate graphical display of the data shown in **Table**.



(3)

(d) The psychologist used random sampling to select the participants in this study.

Explain **one** strength of using a random sample.

(2)

(e) (i) The psychologist used an independent groups design in this study.

Briefly explain **one** limitation of using an independent groups design in this study.

(2)

(ii) Explain how the limitation that you have identified in your answer to **(e) (i)** might have been overcome.

(2)

(f) (i) What is meant by an *extraneous variable*?

(1)

(ii) Explain why it is important to control extraneous variables in experimental research.

(2)

(g) Write a short set of instructions that the psychologist could have read to the participants in the experimental condition.

(4)

(Total 20 marks)

Q8.

A psychologist carried out an experiment using an independent groups design. The psychologist wished to investigate the effectiveness of a strategy for memory improvement. In one condition, participants were taught a memory improvement strategy. In the other condition, participants were not taught this memory improvement strategy. All participants were asked to memorise 10 pictures of familiar objects. For example, the first was a doll, the second was an apple. All participants were then given 50 pictures each, and asked to select the original 10.

The psychologist did a pilot study before carrying out the experiment. The results of the experiment are shown in the table below.

(a) Write a directional hypothesis for this experiment.

(2)

(b) Explain what is meant by an independent groups design.

(1)

(c) Explain **one** strength and **one** limitation of using an independent groups design.

(4)

(d) Explain why the psychologist did a pilot study.

(3)

The mean number of pictures correctly identified and standard deviations for participants with the memory improvement strategy and without the memory improvement strategy

	With memory improvement strategy	Without memory improvement strategy
Mean	8	7
Standard Deviation	2.80	0.29

(e) What do the standard deviations in the table above tell us about the performance of the two groups?

(2)

(Total 12 marks)

Q9.

It is thought that colours might affect our performance when carrying out certain tasks. Research in this area has been inconclusive. Some studies have shown that red improves performance but others have found the opposite. It could be that these contradictory results have arisen because red is beneficial only for certain kinds of mental processing. Some psychologists tested this hypothesis in a series of independent-groups design experiments using students at a Canadian university.

The experiments involved computer tasks, with either a red, blue or neutral background appearing on the monitor. The researchers found that participants were better at a word-recall task and a spell-checking task when the screen background was red rather than blue or neutral. However, participants thought of more creative ideas when the screen was blue rather than red or neutral.

The researchers concluded that red is beneficial for tasks that require attention to detail whereas blue aids creativity.

(a) What were the researchers' aims in this study?

Imagine that you are writing up the report for this series of experiments.

(2)

(b) What is the purpose of the introduction section of a report?

A psychological report also contains a discussion section. Researchers are expected to consider their findings critically and discuss issues such as validity.

(2)

(c) What is meant by validity?

(1)

(d) In the discussion section, researchers are also expected to consider any possible applications of their research. Suggest **one** practical application that might arise from these findings.

In a further experiment, participants were given 20 blue shapes or 20 red shapes. They were then asked to pick 5 shapes and use them to make a toy suitable for a child aged between five and eleven years. They were given a limited time to carry out this task.
Participants given red shapes made toys that independent judges rated to be more practical but less original, whereas participants given blue shapes made more creative toys.

(2)

(e) Explain why the researchers asked independent judges to rate the toys.

(2)

(f) Write a set of standardised instructions that would be suitable to read out to participants in this experiment.

(5)

(Total 14 marks)