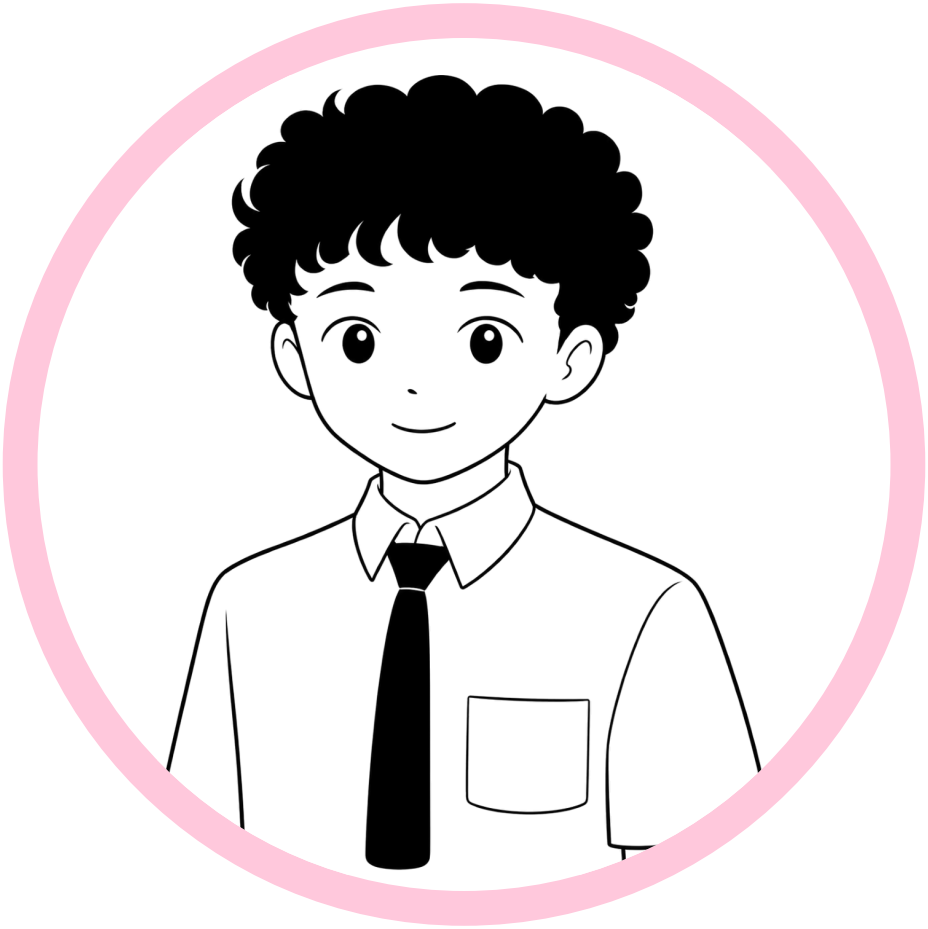
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



EXAM QUESTION PACK

3.2.3.1 AIMS AND HYPOTHESES

SCORE	PERCENTAGE
/289	%

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Q1.

A psychologist decided to conduct an experiment to investigate the effect of watching horror films before going to bed.

A volunteer sample of 50 university students consented to take part in the experiment.

The 50 students were randomly split into two groups. **Group 1** watched a horror film before going to bed each night for the first week then a romantic comedy before going to bed each night for the second week. **Group 2** watched the romantic comedy in the first week and the horror film in the second week.

When the students woke up each morning, each student received a text message that asked if they had had a nightmare during the night. They could respond 'yes' or 'no'.

(a) Write a brief consent form that would have been suitable for use in this experiment.

The consent form should:

- include some detail of what participants might expect to happen
- refer to ethical issues
- be in an appropriate format / style.

(6)

(b) The psychologist proposed a directional hypothesis.

Write a directional hypothesis for this experiment.

(3)

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(c) The psychologist used a repeated measures design in this experiment.

Explain why it was important to use a repeated measures design in this case.

(2)

(d) The psychologist used counterbalancing in this experiment.

Explain why it was appropriate to use counterbalancing in this experiment.

(2)

(e) Explain how the psychologist could have randomly split the sample of 50 students into the two groups.

(3)

The psychologist collated the responses of all the participants over the two-week period and calculated the mean and standard deviation for each condition.

Mean number of nightmares reported and the standard deviation for each condition

	Mean number of nightmares in 7 days	**Standard deviation**
Horror films	2.18	1.48
Romantic comedies	0.30	0.61

(f) What do the mean **and** standard deviation values in the table above suggest about

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the effect of the type of film watched on the occurrence of nightmares? Justify your answer.

(4)

(g) The psychologist found that the difference in the number of nightmares reported in the two conditions was significant at $p<0.05$.

Explain what is meant by 'significant at $p<0.05$' in the context of this experiment.

(2)

(h) The psychologist was concerned about the validity of the experiment.

Suggest **one** possible modification to the design of the experiment and explain how this might improve validity.

(3)

(Total 25 marks)

Q2.

Students often claim that listening to music helps them to concentrate. A psychologist was not aware of any previous research in this area. She decided to investigate this claim.

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Forty students from a nearby sixth form centre volunteered to take part in her study. They each answered the following question:

‘Do you think that you concentrate on your work ‘better’, ‘worse’ or ‘the same’ if you listen to music while working?’

She obtained the results in **Table 1**.

Table 1: Responses to question - ‘Do you think that you concentrate on your work ‘better’, ‘worse’ or ‘the same’ if you listen to music while working?’

Better	Worse	The same
22	8	10

(a) Should the hypothesis for this study be directional? Explain your answer.

(2)

(b) What percentage of the students reported that they would be able to concentrate ‘better’ if they listened to music while they worked? Show your workings.

(2)

(c) Explain why using stratified sampling might improve this study.

(2)

(d) The data collected in this study is primary data.

Explain what is meant by ‘primary data’.

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(2)

(e) In a follow-up study, the psychologist obtained a volunteer sample of 10 students aged 17 years from a different sixth form centre. Using a repeated measures design, participants were asked to complete two puzzle tasks as quickly as possible.

Task A was to find 10 differences in a ‘spot the difference’ puzzle while working in silence.

Task B was to find 10 differences in another ‘spot the difference’ puzzle while listening to music through headphones.

The tasks were counterbalanced and the time taken to complete each task was recorded for each student.

Table 2: Times taken (in seconds) to complete Task A (silence) and Task B (music)

Participant	Task A (silence)	Task B (music)
1	67	82
2	45	70
3	58	60
4	43	59
5	72	77
6	90	105
7	101	90
8	37	59
9	54	83
10	63	89

Explain **one** reason why the mean would be the most appropriate measure of central tendency to summarise the data in **Table 2**.

(2)

(f) Calculate the mean values for **both** Task A **and** Task B. Show your workings.

Task A

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Task B

(4)

(g) The psychologist used counterbalancing in the follow-up study.

Discuss the purpose of counterbalancing.

(3)

(h) Identify **one** possible extraneous variable that the psychologist should have controlled in this follow-up study. Explain how this variable might have affected the results of the study if it was not controlled.

(3)

(i) Explain how the follow-up study could be said to be an improvement on the original study.

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(4)

(Total 24 marks)

Q3.

A researcher wanted to compare the effectiveness of two therapies for young offenders who had been identified as having anger management issues. Offenders, who were all sentenced to two years in a Young Offenders' Institution, were asked to volunteer to take part in an anger management programme. Fifty volunteers were randomly allocated to Group 1 (Therapy A) or Group 2 (Therapy B).

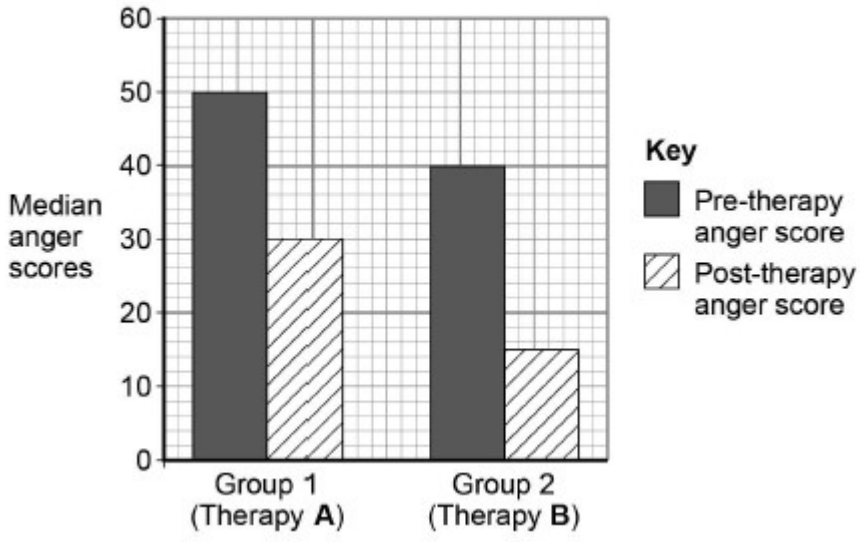
Each participant's anger was assessed before and after therapy. For the **pre-therapy anger score** they completed an Anger Scale questionnaire and their responses were scored. A high score indicated extreme anger and a low score indicated mild anger.

For the next eight weeks, participants attended weekly sessions for either Therapy A or Therapy B.

For the **post-therapy anger score**, at the end of the treatment period, participants completed the same Anger Scale questionnaire.

The data obtained are shown in the figure below.

Median anger scores before and after therapy for Group 1 (Therapy A) and Group 2 (Therapy B)



(a) The researcher used volunteers for this study. Outline **one** disadvantage of using volunteers to take part in this study.

_____

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(2)

(b) Explain how the researcher could allocate the volunteers randomly to the conditions of the experiment.

(3)

(c) Write a suitable hypothesis for this study.

(3)

(d) What do the data in the figure above seem to suggest?

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(3)

(e) Explain how the study might be improved by using a matched pairs design.

(4)

(f) Outline **one** ethical issue that might have occurred in this study and explain how the researcher could have dealt with this issue.

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(4)

(g) Give **one** disadvantage of using median values as seen in the figure above to represent the anger scores of participants.

(1)

(h) Explain how demand characteristics might have occurred in this study.

(2)

(i) The researcher used a questionnaire to assess the anger scores of the offenders. Briefly discuss **one** strength of using questionnaires in research.

(Total 24 marks)

Q4.

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.

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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.

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(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.

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(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.**

Extra space

(6)

(Total 24 marks)

Q5.

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.

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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.

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(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)

Q6.

Read the item and then answer the questions that follow.

Researchers were interested in the spatial awareness skills of motorists. They decided to investigate a possible relationship between different aspects of spatial awareness. Motorists who had between ten and twelve years of driving experience and held a clean driving licence with no penalty points were asked to complete two sets of tasks.

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Set 1: To follow a series of instructions and using a map, to identify various locations correctly. This provided a map reading score for each motorist with a maximum score of 20.

Set 2: To complete a series of practical driving tasks accurately. This involved tasks such as driving between cones, driving within lines and parking inside designated spaces. Each motorist was observed completing the **Set 2** tasks by a single trained observer who rated each performance by giving the driver a rating out of 10.

The following results were obtained.

The map reading scores and driver ratings of motorists

Participant driver	Map reading score	Driver rating
1	17	9
2	8	4
3	15	7
4	12	6
5	3	2
6	4	4
7	6	8
8	14	6
9	19	10

(a) Should the hypothesis be directional? Explain your answer.

_____

_____

_____

_____

_____

(2)

(b) Write a suitable hypothesis for this investigation.

_____

_____

_____

_____

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(3)

(c) Identify a suitable graphical display for the data in the table and briefly explain why this display would be appropriate.

(2)

(d) Using the data in the table, comment on the relationship between the map reading scores and the driver rating scores of the participants.

(3)

(e) Briefly outline **one** problem of using a single trained observer to rate the participants' driving skills in the practical task. Briefly discuss how this data collection method could be modified to improve the reliability of the data collected.

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(6)

(f) The researchers decided to analyse the data using a Spearman's rho test. Explain why this is a suitable choice of test for this investigation.

(3)

Table of critical values for a Spearman's rho test

	Level of significance for a two-tailed test			
	0.10	**0.05**	**0.02**	**0.01**
	Level of significance for a two-tailed test			
	0.05	**0.025**	**0.01**	**0.005**
N= **8**	**0.643**	**0.738**	**0.833**	**0.881**
9	**0.600**	**0.700**	**0.783**	**0.833**
10	**0.564**	**0.648**	**0.745**	**0.794**

Calculated r_s must EQUAL or EXCEED the critical value for significance at the level shown.

(g) After analysis of the data the researchers obtained a calculated value of **r_s= 0.808.**

Using the information in the table above, what conclusion can the researchers draw about the relationship between the map reading and driving skills of the motorists? Explain your answer.

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(4)
(Total 23 marks)

Q7.

Read the item and then answer the questions that follow.

> Following previous research indicating the social benefits of green space in urban areas, two psychology students decided to observe social behaviour in public spaces. They focused on two neighbouring towns, Greensville where most public spaces were planted with flowers and vegetables, and Brownton where most public spaces were paved with concrete.
>
> The students compared the instances of considerate behaviours in the two towns. Considerate behaviour categories included putting litter in the bin, having a dog on a lead and riding a bike with care.
>
> The observations were carried out in four different areas of a similar size in each town on weekdays between the hours of 4.30pm and 6.00pm. The students worked together to ensure inter-observer reliability, recording each target behaviour whenever it occurred.

(a) Should the hypothesis for this research be directional or non-directional? Explain your answer.

(2)

(b) Before the observation could begin, the students needed to operationalise the behaviour category 'riding a bike with care'.

Explain what is meant by operationalisation and suggest **two** ways in which 'riding a bike with care' could have been operationalised.

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(4)

(c) The students thought that having a dog on a lead was a useful measure of considerate behaviour because it had face validity. Explain what is meant by face validity in this context.

(3)

(d) Identify and briefly outline **two** other types of validity in psychological research.

(4)

(e) Identify the behaviour sampling method used by the students. Shade **one** box only.

A Time sampling ⬭

B Pair sampling ⬭

C Event sampling ⬭

D Target sampling ⬭

(1)

(f) Explain how inter-observer reliability could be ensured by working as a pair.

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(3)

(g) The data for considerate behaviours is shown in the **Table 1**.

Table 1

Considerate behaviours			
	Litter in bin	Dog on lead	Riding bike with care
Greensville	23	23	10
Browntonn	10	17	9

The students noted that overall more considerate behaviours occurred in Greensville than in Brownton.

Calculate the ratio of considerate behaviours observed in Greensville to considerate behaviours observed in Brownton. Show your workings and present your answer in the simplest form.

(3)

(h) The students carried out a Chi-square test on their data.

Explain why the Chi-square test was an appropriate test to use in this case.

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(3)

(i) In order to interpret the results of the Chi-square test the students first needed to work out the degrees of freedom. They used the following formula.

Degrees of freedom (df) = (r–1) x (c–1)
r = number of rows and c = number of columns

Calculate the degrees of freedom for the data in **Table 1**. Show your workings.

(2)

(j) The calculated value of Chi-square was 6.20. Referring to the **Table 2** below, state whether or not the result of the Chi-square test is significant at the 0.05 level of significance. Justify your answer.

Table 2

df	*Levels of significance for a one-tailed test*			
	0.10	**0.05**	**0.025**	**0.01**
	Levels of significance for a two-tailed test			
	0.20	**0.20**	**0.05**	**0.02**
1	1.64	2.71	3.84	5.41
2	3.22	4.60	5.99	7.82
3	4.64	6.25	7.82	9.84
4	5.99	7.78	9.49	11.67

To be significant at the level shown the calculated value of Chi Square must be equal to or greater than the critical/table value

(3)

(k) In the discussion section of their report of the investigation the students wanted to further discuss their results in relation to levels of significance.

Write a short paragraph the students could use to do this.

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(4)

(l) As a follow-up to their observation the students decided to interview some of their peers about inconsiderate behaviours in their 6th Form Centre. The interviews were recorded.

Explain how the students could develop their interview findings by carrying out a content analysis and why content analysis would be appropriate in this case.

(3)

(m) Suggest **one** inconsiderate behaviour that the students might focus on in their content analysis.

(1)

(Total 36 marks)

Q8.

A researcher investigated whether memory for words presented with pictures was better than memory for words presented without pictures. The researcher used an independent groups design.

In **Condition 1**, participants were given a limited time to learn a list of 20 words. They were then asked to recall the 20 words in any order.

In **Condition 2**, participants were given the same time to learn the same 20 words, but this time each word was presented with a picture. For example, the word 'apple' was presented alongside a picture of an apple. They were then asked to recall the 20 words in any order.

(a) A pilot study is a small-scale investigation carried out before the main study.

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Explain why it would be appropriate for this researcher to use a pilot study. In your answer you must refer to details of the experiment given above.

Extra space

(4)

(b) State a non-directional hypothesis for this experiment.

(2)

(c) Explain **two** reasons why it was more appropriate to use an independent groups design than a repeated measures design.

Reason 1

Reason 2

(4)

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The range and median number of words correctly recalled for participants shown words without pictures and for participants shown words with pictures

	Condition 1 Words without pictures	Condition 2 Words with pictures
Median number of words correctly recalled	13	16
Range	11	13

(d) What do the scores in the table above show?

_____

_____

_____

_____

(2)

After he had carried out the experiment, the researcher noticed that one participant in **Condition 1** had recalled all 20 words. The researcher thought that this participant might have used a strategy for memory improvement, even though he had not been told to do so.

(Total 12 marks)

Q9.

Some studies have suggested that there may be a relationship between intelligence and happiness. To investigate this claim, a psychologist used a standardised test to measure intelligence in a sample of 30 children aged 11 years, who were chosen from a local secondary school. He also asked the children to complete a self-report questionnaire designed to measure happiness. The score from the intelligence test was correlated with the score from the happiness questionnaire. The psychologist used a Spearman's rho test to analyse the data. He found that the correlation between intelligence and happiness at age 11 was +0.42.

(a) Write an operationalised non-directional hypothesis for this study.

(2)

(b) Identify an alternative method which could have been used to collect data about happiness in this study. Explain why this method might be better than using a questionnaire.

(4)

(c) A Spearman's rho test was used to analyse the data. Give **two** reasons why this test was used.

(2)

Extract from table of critical values from Spearman's rho(r_s) test

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N (number of participants)	Level of significance for a two-tailed test	
	0.10	**0.05**
	Level of significance for a one-tailed test	
	0.05	**0.025**
29	0.312	0.368
30	0.306	0.362
31	0.301	0.356

Calculated r_s must equal or exceed the table (critical) value for significance at the level shown.

(d) The psychologist used a non-directional hypothesis. Using the table above, state whether or not the correlation between intelligence and happiness at age 11 (+0.42) was significant. Explain your answer.

(3)

(e) Five years later, the same young people were asked to complete the intelligence test and the happiness questionnaire for a second time. This time the correlation was –0.29.

With reference to **both** correlation scores, outline what these findings seem to show about the link between intelligence and happiness.

(4)

(Total 15 marks)

Q10.

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

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than a laboratory experiment.

(2)

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

Sampling technique

Evaluation

Extra space

(4)

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

Extraneous variable

How this extraneous variable could have affected the results of this experiment

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Extra space

(4)
(Total 12 marks)

Q11.

Two psychologists investigated the relationship between age and recall of medical advice. Previous research had shown that recall of medical advice tended to be poorer in older patients. The study was conducted at a doctor's surgery and involved a sample of 30 patients aged between 18 and 78 years. They all saw the same doctor, who made notes of the advice that she gave during the consultation.

One of the psychologists interviewed each of the patients individually, immediately after they had seen the doctor. The psychologist asked each patient a set of questions about what the doctor had said about their diagnosis and treatment. The patients' responses were recorded and then typed out. Working independently the psychologists compared each typed account with the doctor's written notes in order to rate the accuracy of the accounts on a scale of 1 – 10. A high rating indicated that the patient's recall was very accurate and a low rating indicated that the patient's recall was very inaccurate.

(a) The psychologists decided to propose a directional hypothesis. Why was a directional hypothesis appropriate in this case?

(1)

(b) Write a suitable directional hypothesis for this investigation.

(3)

(c) The psychologists were careful to consider the issue of reliability during the study. What is meant by reliability?

(1)

(d) Explain how the psychologists might have assessed the reliability of their ratings.

(3)

(e) This study collected both qualitative and quantitative data. From the description of the study above, identify the qualitative data and the quantitative data.

The psychologists used Spearman's rho to analyse the data from their investigation. They chose to use the 0.05 level of significance. The result gave a correlation coefficient of −0.52.

(2)

(f) Give **two** reasons why the psychologists used Spearman's rho to analyse

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the data.

(2)

(g) Using the table below, state whether the result is significant or not significant and explain why.

(2)

Extract from a table of critical values of Spearman's rho (r_s)

Level of significance for a one-tailed test		
	0.05	0.01
Level of significance for a two-tailed test		
	0.10	0.02
N=29	0.312	0.433
30	0.306	0.425
31	0.301	0.418

Calculated r_s must equal or exceed the table (critical) value for significance at the level shown.

(h) Explain what is meant by a Type 1 error.

(2)

(i) Use the information in the table above to explain why the psychologists did not think that they had made a Type 1 error in this case.

(3)

(Total 19 marks)

Q12.

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.

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(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.

Strength

Limitation

(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

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

_____

_____

_____

_____

(2)

(Total 12 marks)

Q13.

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

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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)

Q14.

Psychological research suggests an association between birth order and certain abilities. For example, first-born children are often logical in their thinking whereas later-born children tend to be more creative. A psychologist wonders whether this might mean that birth order is associated with different career choices. She decides to investigate and asks 50 artists and 65 lawyers whether they were the first-born child in the family or not.

(a) Write a non-directional hypothesis for this study.

(2)

(b) Identify an appropriate sampling method for this study and explain how the psychologist might have obtained such a sample

The psychologist found the following results:

- 20 of the 50 artists were first-born children
- 35 of the 65 lawyers were first-born children.

She analysed her data using a statistical test and calculated a value of x^2 = 2.27. She then looked at the relevant table to see whether this value was statistically significant. An extract from the table is provided below.

Table: Critical values of x^2

Level of significance for a one-tailed test				
	0.10	0.05	0.025	0.01
Level of significance for a two-tailed test				
	0.20	0.10	0.05	0.02
df				
1	1.64	2.71	3.84	5.41

Calculated value of x^2 must be equal to or exceed the table (critical) values for significance at the level shown

(3)

(c) Imagine that you are writing the results section of the report on this investigation.

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Using information from the description of the study above and the relevant information from the statistical table, provide contents suitable for the results section.

You must provide all of the following:

- an appropriately labelled 2×2 contingency table a sketch of an appropriately labelled bar chart
- identification of the appropriate statistical test with justification for its use
- identification of an appropriate significance level
- a statement of the results of the statistical test in relation to the hypothesis.

(12)

(Total 17 marks)

Q15.

A researcher carried out an experiment to investigate how many numbers could be held in short-term memory. The participants were 15 children and 15 adults. Participants were asked to repeat lists of random numbers, in the correct order, as soon as they were read out by the researcher. For example, when the researcher said, “3, 4, 2, 8” the participant immediately repeated “3, 4, 2, 8”. When the researcher then said,“7, 5, 9, 6, 4” the participant immediately repeated “7, 5, 9, 6, 4”. One number was added to the list each time until participants were unable to recall the list correctly.Each participant’s maximum digit span was recorded.

(a) Write an appropriate non-directional hypothesis for this experiment.

_____

_____

_____

_____

(2)

(b) Explain why the researcher used an independent groups design for this experiment.

_____

_____

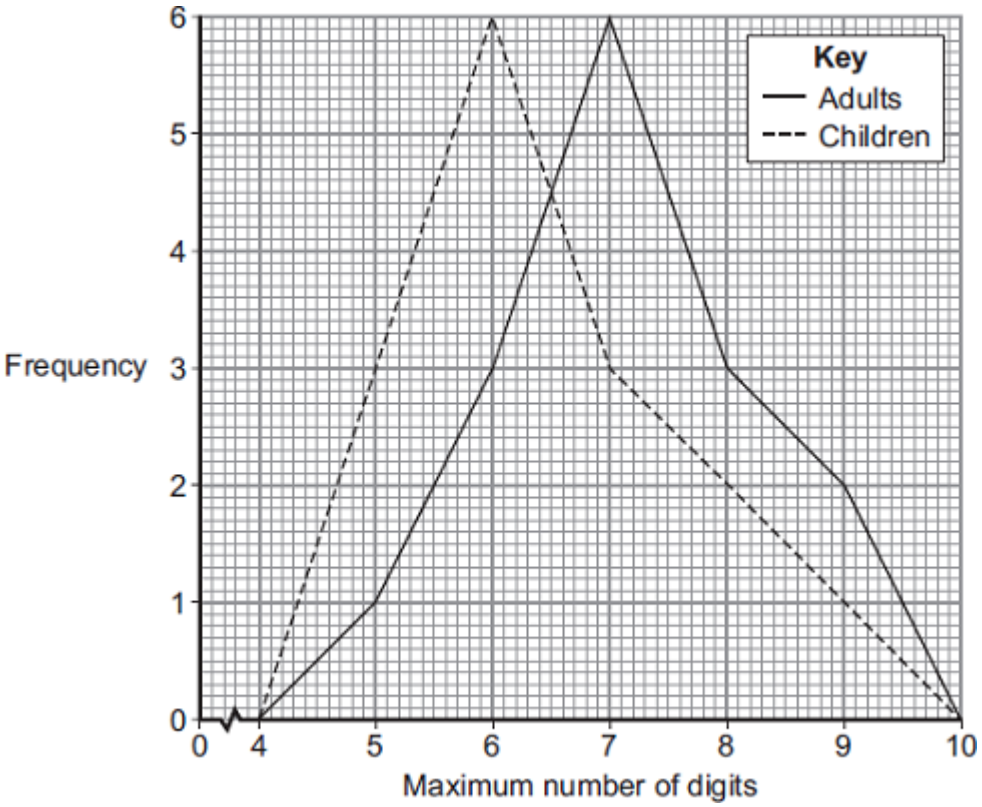
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_____

(2)

(c) **Frequency distribution of the maximum number of digits correctly recalled by children and adults**

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Write the mode for each group in the table below.

Age group	Mode
Children	
Adults	

(2)

(d) What does the frequency distribution show about the results?

(3)

(e) Do the results of this experiment support the findings of other research into the capacity of short-term memory? Explain your answer.

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_____

_____

(2)

(Total 11 marks)

Q16.

(a) The psychologist was also interested in the effects of a restricted diet on memory functioning and he expected memory to become impaired. The psychologist's hypothesis was that participants' scores on a memory test are lower after a restricted diet than before a restricted diet. He gave the volunteers a memory test when they first arrived in the research unit and a similar test at the end of the four-week period. He recorded the memory scores on both tests and analysed them using the Wilcoxon signed ranks test. He set his significance level at 5%.

His calculated value was $T = 53$.

State whether the hypothesis for this study is directional or non–directional.

(1)

(b) **Table: Extract from table of critical values from the Wilcoxon signed ranks test**

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.1	0.05
N	*T*≤	
19	53	46
20	60	52
21	67	58
22	75	65

Calculated *T* must be equal to or less than the critical value (table value) for significance at the level shown

Using the table above, state whether or not the psychologist's result was significant. Explain your answer.

(3)

(Total 4 marks)

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