

Q1.

Studies into the effectiveness of drugs in the treatment of schizophrenia sometimes combine the results of a number of different studies.

Suggest **one** of the following techniques as an appropriate way to combine the results of different studies.

A Content analysis

☐

B Correlational analysis

☐

C Meta-analysis

☐

D Thematic analysis

☐

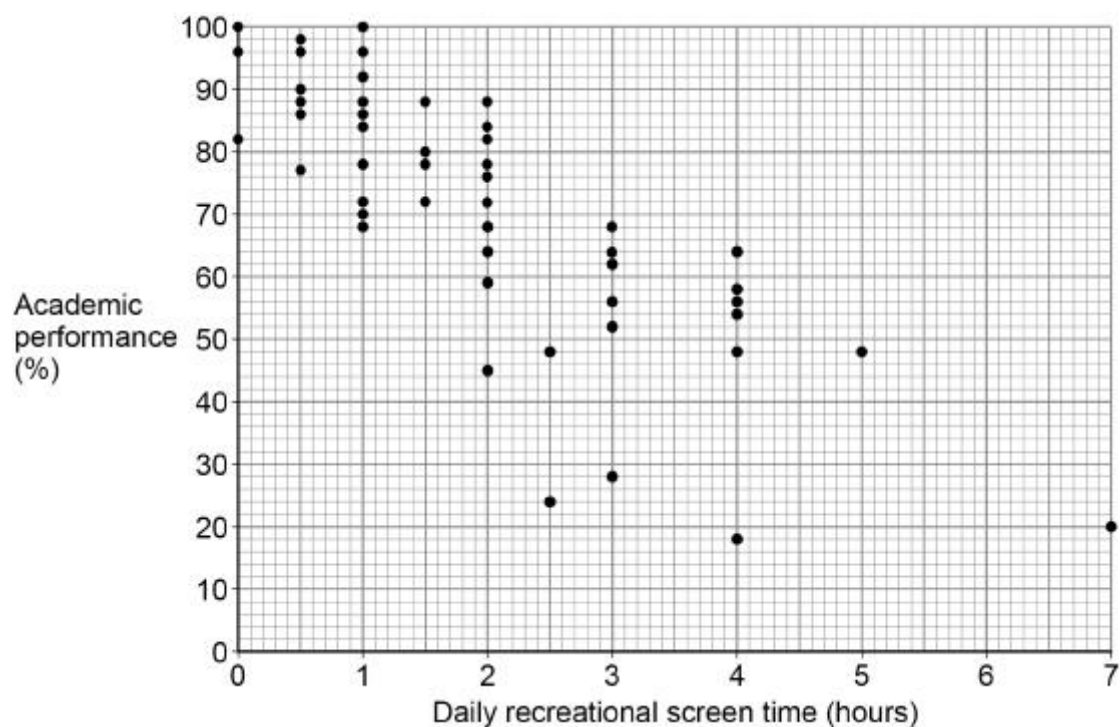
(Total 1 mark)

Q2.

A study into the relationship between recreational screen time and academic achievement was conducted. Students were asked to self-report the number of hours spent watching TV, playing on their mobile phones or video games (daily recreational screen time) and their end-of-year test performances (academic performance).

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

The relationship between daily recreational screen time and academic performance



- (a) In which section(s) of a scientific report would you expect to find reference to the results/findings of the investigation?

Shade **one** circle only.

- | | |
|---|-----------------------|
| A The abstract and the results sections only | ☐ |
| B The abstract, the discussion and the results sections only | ☐ |
| C The results and the discussion sections only | ☐ |
| D The results section only | ☐ |

(1)

- (b) Which of the following correlation co-efficients best describes the data represented in the graph above?

Shade **one** circle only.

- | | |
|------------------|-----------------------|
| A -0.80 | ☐ |
| B -0.25 | ☐ |
| C $+0.25$ | ☐ |
| D $+0.80$ | ☐ |

(1)

- (c) Identify the type of graph shown in the figure above and explain why this is an appropriate graph to use for the data collected.

(3)

- (d) Explain why it would not be appropriate for the researchers to conclude that increased recreational screen time reduces academic performance.

(2)

- (e) A psychologist reads a review of a meta-analysis confirming the relationship between recreational screen time and academic performance.

What is meant by the term meta-analysis?

(2)

(Total 9 marks)

Q3.

A teacher investigated students' attitudes to the school's uniform rules. The school consisted of students from Years 7–11, with 100 students in each year.

She conducted interviews individually with 10 students. One of the questions in the interview was, 'How many times have you been 'told off' for not following the school's uniform rules this term?' The results from this question are shown in the table below.

Number of times each student had been 'told off' that term

Student	Number of times 'told off'
1	1
2	7
3	2
4	3
5	4
6	5
7	3
8	1
9	25
10	2

Explain why the median would be a more appropriate measure of central tendency than the mean for the data in the table above.

(Total 2 marks)

Q4.

A psychologist wanted to investigate whether exercise would affect stress levels in 15-year-olds. Previous research into the effects of exercise on stress in teenagers had shown that exercise decreased stress levels.

The psychologist decided to use a repeated measures design to investigate the effects of exercise on stress levels in 20 15-year-old students. All the students were approaching their end-of-year exams.

For **Condition A**, students were required to complete a 2 km run during their morning breaktime each school day for one week.

In **Condition B**, students continued their normal activities in the playground during their morning breaktime each school day for one week.

At the end of each week of the investigation, for both **Condition A** and **Condition B**, each student was asked to rate their levels of stress on a rating scale of 1–10, where the higher the self-reported rating the greater the stress levels.

Explain **one** strength **and one** limitation of collecting quantitative data in this study.

(Total 4 marks)

Q5.

A psychologist wanted to investigate whether exercise would affect stress levels in 15-year-olds. Previous research into the effects of exercise on stress in teenagers had shown that exercise decreased stress levels.

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For **Condition A**, students were required to complete a 2 km run during their morning breaktime each school day for one week.

In **Condition B**, students continued their normal activities in the playground during their morning breaktime each school day for one week.

At the end of each week of the investigation, for both **Condition A** and **Condition B**, each student was asked to rate their levels of stress on a rating scale of 1–10, where the higher the self-reported rating the greater the stress levels.

The psychologist calculated the median and range of stress ratings after each condition. This data is presented in the table below.

Median and range of stress ratings reported in each experimental condition

	Condition A (2 km breaktime run)	Condition B (normal breaktime activities)
Median stress levels	5	6.5
Range	6	3

- (a) What do the median and range values presented in the table above suggest about the students' stress ratings after each condition? Justify your answer.

- (b) Explain **one** limitation of using the range to represent the spread of stress ratings.

(4)

(Total 8 marks)

Q6.

A psychologist investigated the relationship between stress and illness at a local school. The psychologist placed an advert on the staffroom noticeboard. Ten teachers contacted the psychologist offering to complete the psychologist’s questionnaire.

Then, in a follow-up study, the psychologist asked the same ten teachers to take part in an experiment to compare two strategies designed to encourage relaxation and lower heart rate.

Condition 1: Five of the teachers were given meditation techniques to complete every day for a week.

Condition 2: The other five teachers were given a healthy diet to follow for a week.

Each teacher’s heart rate was measured at the start of the week and at the end of the week.

The results are summarised in the table below.

Mean and standard deviation values for meditation and healthy diet conditions

	Meditation condition		Healthy diet condition	
	Start of week	End of week	Start of week	End of week
Mean heart rate	76	68	80	79
Standard deviation	3.8	1.8	4.0	3.9

(a) What do the mean values in the table above suggest about the effectiveness of the different strategies? Justify your answer.

(2)

(b) What do the standard deviation values for the meditation condition suggest? Justify your answer.

(2)

- (c) Outline how the psychologist could have obtained informed consent when conducting the follow-up study.

(3)

- (d) In the follow-up study, the psychologist used a different group of people in each condition, which could have affected the results.

Outline **two** ways in which the psychologist might change the design of this study to deal with this problem.

Change 1

Change 2

(6)

(Total 13 marks)

Q7.

Researchers studied therapies for schizophrenia. They assessed the mood of two groups of participants before the participants received therapy. The same participants were assessed again after four weeks of receiving therapy.

Group 1 (Drug therapy group) received drug therapy alone.

Group 2 (Combined therapy group) received a combination of drug therapy and cognitive therapy.

The researchers assessed mood using a standardised test of mood. A low score indicated negative mood and a high score indicated positive mood. Scores ranged from 0 to 100. The lowest score was 24 and the highest score was 83.

The table below shows the results of the study after four weeks of therapy.

Mean mood scores for Group 1 (Drug therapy group) and Group 2 (Combined therapy group) after four weeks of therapy

	Group 1 (Drug therapy group)	Group 2 (Combined therapy group)
Mean mood score	36.4	60.5

In this study, the mood scores were assumed to be an interval level of measurement because the test of mood was standardised.

Explain how you could convert the mood scores from this study into:

- i) ordinal data
- and**
- ii) nominal data.

(Total 4 marks)

Q8.

A researcher investigated whether there was a correlation between the number of hours slept and how well rested students felt.

The researcher randomly selected 18 participants from first-year students at a university.

On the day of the study, each student participant was asked, 'How many hours did you sleep last night?' They then had to rate on a scale of 1 to 5 how well rested they felt.

The researcher hypothesised that there would be a positive correlation between the two co-variables.

- (a) Outline **one** reason why it was appropriate to conduct a correlation rather than an experiment in this case.

(2)

- (b) Describe how the researcher could have used random sampling to obtain the students for this study.

(3)

The researcher used Spearman’s rho statistical test to analyse the data from this study.

- (c) Explain why Spearman’s rho was a suitable test for this study. Refer to the description of the study in your answer.

(4)

The researcher chose to use the 5% level of significance and the calculated correlation coefficient for the Spearman’s rho test was 0.395

Critical values of rho

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.10	0.05
N = 16	0.429	0.503
17	0.414	0.485
18	0.401	0.472
19	0.391	0.460
20	0.380	0.447

The calculated value of rho must be greater than or equal to the critical value to be significant.

- (d) Identify the appropriate critical value from the table above. Explain your choice.

(4)

- (e) Explain whether the researcher's hypothesis should be accepted. Refer to the critical value identified in **part (d)** in your answer.

(2)

- (f) Explain why the researcher decided to use the 5% level of significance rather than the 1% level in this study.

(2)

When the researcher compared the calculated and critical values of ρ , he began to wonder if he might have made a Type II error.

- (g) Explain what is meant by a Type II error in the context of this study.

(2)

(Total 19 marks)