**Interpreting the data-questions**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Participant | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **Cigarettes per day before the course** | **4** | **10** | **3** | **5** | **10** | **3** | **4** | **2** |
| **Cigarettes per day after the course**  | **2** | **5** | **1** | **6** | **10** | **0** | **3** | **3** |

**Question nine**

A researcher wanted to test the hypothesis that attending a motivational course would decrease the number of cigarettes that smokers smoked in a day. He collected data on how many cigarettes on average 8 smokers smoked the week before the course and in the week after. His results are shown in the table. On conducting a Wilcoxon test, he calculated an observed value of T=4. He used a significance level of 5%.

1. Did smokers significantly reduce their smoking in the week following the course? Fully justify your answer (4 marks)

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**Question ten**

A psychologist was investigating whether a new drug reduces symptoms of anxiety. He recruited 12 participants who showed similar levels of anxiety. Half of these12 participants were administered the drug and the other half were given a placebo. Half an hour after administering the drug he measured anxiety levels of all 12 participants.

1. A Mann-Whitney U test was used, explain why this is the most appropriate test (3 marks)



1. He got a value of U=4. Are his results significant at the 0.05 level? Explain your answer (4 marks)
2. What conclusion can the researcher draw from the results? (3 marks)

**Question eleven**

|  |  |
| --- | --- |
| **Female score** | **Male score** |
| 58 | 24 |
| 67 | 45 |
| 64 | 75 |
| 29 | 35 |
| 70 | 82 |
| 12 | 65 |
| - | 49 |

A psychologist hypothesises that there will be a significant difference in the time males and females take to complete a logic problem but is not sure who will be faster. Participants are asked to complete a logic problem and their times are recorded, in seconds. The results are shown in the table. He uses an **unrelated t-test** to calculate an observed value of t=-0.286.

1. Write a null hypothesis for this research (2 marks)

2. Are the results significant at 0.05 level? Fully explain your answer (4 marks)

**Question twelve**

A psychologist hypothesises that people who take longer to run 2km have slower reaction times. She records the time 10 participants take to run 2km and each participant then completes a reaction time experiment and their scores are noted. She conducts a Pearson’s r test on the data, calculating r=-0.152.

1. Describe the correlation between running time and reaction time shown by the correlation coefficient of -0.152
2. Is the correlation significant at the 0.05 level? Justify your answer (4 marks)



**Question thirteen**

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. She is excited as this has never been investigated before.

The psychologist found the following results:

* 20 of the 50 artists were first-born children
* 35 of the 65 lawyers were first-born children.
1. Construct a 2 x 2 contingency table using the results above (4 marks)



1. Identify an appropriate statistical test for this investigation and give three reasons for your choice (1 and 3 marks)
2. The observed value is 2.25 and the level of significance is 5%. Are the findings significant? Fully explain your answer (4 marks)

**Answers**

Qu9- T=4 Critical value is 5, T must be ≤ CV

4≤5 therefore is significant so Smokers did smoke significantly fewer cigarettes per fay in the week after the motivational course.

Qu 10

1. Test of difference, independent data, ordinal data
2. Yes, for mann-whitney ov=4 cv=7 so therefore is significant.

11-Not significant

Unrelated T test so OB must be≥ CV

t=-0.286

DF=6+7-2=11 so N=11 and non-directional so

CV=2.201

So as OB≤CV so not significant

Qu 12-negative correlation and fairly weak as -0.152

* Not significant as 0.152 is ≤CV (0.549)

Qu 13-

a) Two marks for correct labelling, 2 marks for correct data

 First born Not first born

Artists 20 30

Lawyers 35 30

b) The Chi-square test (1 mark) because the data can be treated as nominal, the researchers were testing for a difference between artists and lawyers, and the experimental design was an independent groups (3 marks)