Inferential Testing (A2 Only) – Questions by Topic

Q1.

Read the item and then answer the questions that follow.

In a study of parasocial relationships a researcher studied male and female attachments to their favourite film star. An overall attachment score was calculated on the basis of answers to a questionnaire. A high score indicated a strong attachment and a low score indicated little attachment.

The scores are shown in the table below.

Males	**Females**
4	5
6	6
2	6
2	7
3	2
3	4
3	5
8	9
1	5
1	2
Median score 3	Median score 5

(a) Explain why the data in the table is primary data and not secondary data.

(2)

(b) Explain **one** strength of primary data.

(3)

(c) The researcher decided to extend the study by using an inferential test to see if there was a significant difference between the two sets of scores.

Suggest an appropriate inferential test which the researcher could use. Justify your choice.

(4)

(Total 9 marks)

Q2.

Read the item and then answer the questions that follow.

A psychologist was investigating the effect of prison conditions on institutional aggression.

He selected a sample of 12 prisoners and counted the number of aggressive acts of each prisoner over one day in the exercise yard.

The prison conditions were then changed, such that the number of prisoners per cell was reduced and regular exercise periods introduced.

After three months of these new conditions the psychologist observed the same 12 prisoners and again counted the number of aggressive acts of each prisoner over one day in the exercise yard.

This study involves a repeated measures design.

(a) Explain **one** advantage of using a repeated measures design in this study.

(2)

(b) The psychologist obtained the following results:

- For two of the prisoners the number of aggressive acts increased
- For eight of the prisoners the number of aggressive acts decreased
- For two of the prisoners the number of aggressive acts stayed the same

The psychologist decides to use a sign test to see if his data are significant.

What is the calculated value of the sign test statistic 'S'? Explain your answer.

(2)

(c) Look at the table of critical values of 'S' below and then answer the question that follows.

N	.10	.05	.025	.01
4	0			
5	0	0		
6	0	0	0	
7	1	0	0	0
8	1	1	0	0
9	2	1	1	0
10	2	1	1	0
11	2	2	1	1
12	3	2	2	1

To be significant, the calculated/observed value must be equal to or less than the critical/table value.

Using the table of critical values of 'S' above, state whether the findings of the study are significant at $p < 0.05$. Explain your answer.

(2)

(Total 6 marks)

Q3.

The psychologists then wanted to see whether the use of diagrams in medical consultations would affect recall of medical information.

In a laboratory experiment involving a medical consultation role-play, participants were randomly allocated to one of two conditions. In Condition A, a doctor used diagrams to present to each participant a series of facts about high blood pressure. In Condition B, the same doctor presented the same series of facts about high blood pressure to each participant but without the use of diagrams.

At the end of the consultation, participants were tested on their recall of facts about high blood pressure. Each participant was given a score out of ten for the number of facts recalled.

(a) In this case, the psychologists decided to use a laboratory experiment rather than a field experiment. Discuss advantages of carrying out this experiment in a laboratory.

(4)

(b) Identify an appropriate statistical test that the psychologists could use to analyse the data from the follow-up study. Give **one** reason why this test is appropriate.

(2)

(Total 6 marks)

Q4.

(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)

Q5.

In an experiment, researchers arranged for participants to complete a very personal and embarrassing questionnaire in a room with other people. Each participant was tested individually. The other people were confederates of the experimenter.

In condition 1: the confederates completed the questionnaire.

In condition 2: the confederates refused to complete the questionnaire and asked to leave the experiment.

The researchers tested 15 participants in condition 1, and 15 different participants in condition 2.

The researchers recorded the number of participants who completed the questionnaire in each condition.

(a) Identify the type of data in this experiment. Explain your answer.

(2)

(b) Using your knowledge of social influence, explain the likely outcome of this experiment.

(3)

(c) For this study, the researchers had to use different participants in each condition and this could have affected the results.

Outline **one** way in which the researchers could have addressed this issue.

(4)

(d) In order to analyse the difference in the number of participants who completed the questionnaire in each condition, the researchers used a chi-squared test.

Apart from reference to the level of measurement, give **two** reasons why the researchers used the chi-squared test.

(2)

(e) The calculated value of chi-squared in the experiment described above is **3.97**

Critical values for the chi-squared test

Level of significance				
df	0.1	0.05	0.02	0.01

1	2.71	3.84	5.41	6.64

The calculated value of chi-squared should be equal to or greater than the critical value to be statistically significant.

With reference to the critical values in **the table** above, explain whether or not the calculated value of chi-squared is significant at the 5% level.

(2)

(Total 13 marks)