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**Joseph Banks  
Secondary College**

**Research Methods**

**Worth 4% of the School Mark**

**Question/Answer Booklet**

**PSYCHOLOGY**

**Units 3 and 4**

Student name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Time allowed for this paper

## Reading time before commencing work**: three minutes**

Working time for the paper: **sixty minutes**

# Materials required/recommended for this paper

***To be provided by the supervisor:***

This Question/Answer Booklet

Formulae and Data Booklet

***To be provided by the candidate:***

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener,

correction tape/fluid, eraser, ruler, highlighters.

Special items: non-programmable calculators approved for use in the WACE examinations

# Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

**Structure of this paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section | Number of questions available | Suggested working time  (minutes) | Your Mark | Marks available |
| Section One:  Research Methods | 2 | 60 |  | 57 |
|  |  | **Total** |  |  |

**Instructions to candidates**

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2016*. Sitting this examination implies that you agree to abide by these rules.
2. Write your answers in this Question/Answer Booklet.
3. When calculating numerical answers, show your working or reasoning clearly. Your working should be in sufficient detail to allow your answers to be checked readily and for marks to be awarded for reasoning.

In calculations, give final answers to one significant figures and include appropriate units where applicable.

1. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
2. Supplementary pages for the use of planning/continuing your answer to a question may have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

**Question 1 (13 marks)**

Professor Thunberg wanted to test her theory that vegetarians are more intelligent than people who eat meat. She posted a link on twitter to a survey asking questions about eating habits followed by an online intelligence test. She hoped that by conducting her research in this way she could recruit a large and diverse sample from around the world.

After one month she stopped the research when she had collected data from 100,000 people globally. However, her sample was highly skewed towards people who are vegetarians. Her results were as follows:

**Table 1: Results of experiment comparing IQ and meat consumption**

|  |  |
| --- | --- |
|  | **Average IQ as measured by online intelligence test** |
| Vegetarians (80,679) | 126 |
| Meat eaters (19,321) | 105 |

1. Identify what type of research Professor Thunberg is conducting. Explain your answer. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Non-experimental or Correlational | 1 |
| Any point for one mark   * This is a correlation of two variables to identify the relationship between vegetarianism and intelligence. * No variable is manipulated. | 1 |
| **Total** | **2** |

1. Explain the difference between sample and population data. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Sample data is collected from a subset of a population of interest and are the participants (sample) being used in the study. (1)  Population data is data collected from the entire population, therefore representative (1) | 2 |
| **Total** | **2** |

1. With reference to the data, identify what conclusion can drawn. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Further research needs to be conducted (1) as there was an uneven number of meat-eaters and vegetarians that were sampled (vegetarians at 80,000 and meat-eaters at 19,000) and thus invalid results (1) | 2 |
| **Total** | **2** |

1. Complete the table to identify **two** sources of error in Professor Thunberg’s research design and state **one** way of reducing each. (4 marks)

|  |  |  |
| --- | --- | --- |
| **Description** | | **Marks** |
| *One mark for each source of error one mark for each matching reduction up to a maximum of 4 marks* | |  |
| **Source of Error** | **Way of Reducing Error** (\*must match the corresponding source of error) |  |
| By only placing her research on Twitter she is limiting her sample to twitter users who follow her. It is not a representative sample of a population of all meat eaters and vegetarians. | Place the research link on multiple platforms and mediums in order to reach a wider variety of people and improve the sample diversity. | 0-2 |
| The two variable groups are not even in number with 80% of the sample size in one group (Vegetarians) and only 20% in the other group (meat eaters) | Continue the experiment until the group sizes are similar or randomly select only 20,000 vegetarians to use for the experiment | 0-2 |
| Participant variables are not taken into account such as age, education, socioeconomic group | Complete Pre-testing to gather more information about participant variables that could affect results | 0-2 |
| **Total** |  | **4** |

1. Identify and describe the research design that Professor Thunburg used. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Cross-sectional or correlational  collect data from many different individuals at a single point in time.  a type of research that studies the relationship between two variables | 1  1 |
| **Total** | **1** |

1. Describe one disadvantage to the research design that Professor Thunburg used. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Cross-sectional – cohort effects that having been born in a certain time, region, period or having experienced the same life experience (in the same time period) has on the development or perceptions of a particular group.  Correlational – does not show cause and effect or there could be an additional 3rd variable that causes the relationship | 1  1 |
| **Total** | **1** |

**Question 2                                                                                                  (9 marks)**

Since 2003, a group of researchers have been studying the development of two groups of Australian children. At the beginning of the study, one group was aged 0-1 years and the other group was aged 4-5 years.

Researchers will continue to study these 10 000 children and their families until 2018, to collect data on child development and family wellbeing.

1. State the major advantage of this kind of study. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Reduced participant extraneous variables as the same participants are tested repeatedly over time | 1 |
| **Total** | **1** |

1. Identify **one** ethical issue that is associated with this kind of study and state how psychologists deal with them in their research.

(2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Any ethic that is applied properly to longitudinal research  e.g. informed consent (1) –  Parents and children have to consent each time information is gathered (1) | 1  1 |
| **Total** | **1** |

1. Complete the table below to help classify the three different data collection methods. (6 marks)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Interview** | **Likert Scale** | **Heart Rate** |
| **Describe one strength** | Can be flexible in that the researcher is open to explore multiple variables  Collects rich qualitative data | universal method of collecting data, which means it is easy to understand them and easy to analyse | Objective data that does not need interpretation |
| **Describe one limitation** | Time consuming to collect and analyse  Open to interpretation by the researcher when analysing the data | Limits the participants response, you cannot see why the behaviour /attitude occured | Does not give any insight into why the heartrate is increased /decreases |

**Question 3                                                                                                 (12 marks)**

During late adulthood, cognitive processes begin to deteriorate, particularly working memory. Dr Tucker wants to test the effectiveness of the new miracle drug that improves the working memory of the elderly.

1. Identify the type of research design Dr Tucker should use. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Experimental | 1 |
| **Total** | **1** |

1. Outline aspects of the method that Dr Tucker should use to ensure the study will produce reliable and valid results that can be generalised. (5 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Representative sample: pick an age range that is representative of the target population  Baseline reading: Ensure that participants are measured prior for their cognitive abilities, and checked to see if they are on any other medications that may impact the validity  Control group: placebo group, people can improve just by thinking they are taking the new miracle drug.  Double-blind: Participants and researchers don’t know who is in the group with the drug or the placebo  Peer review test-retest: Another scientist conducts the same study to see if they obtain similar results | 0-5 |
| **Total** | **1** |

Dr Tucker tested two different populations, one population from Japan and one from America. He found that the Japanese population had a standard deviation of 2.5 whereas the American population has a standard deviation of 9.5.

1. Explain what this difference in standard deviations means. (3 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Standard deviation refers to the variability in the data  The Japanese population has less variability in cognitive ability, meaning the dta set is much closer to the mean  The American population has higher variability, meaning the data is spread further apart from the mean | 1  1  1 |
| **Total** | **1** |

Dr Tucker wanted to visually display the data so that he could see the distribution, including the mean and standard deviation.

1. Name the graph that would be used to show this. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Frequency distribution  Histogram | 1 |
| **Total** | **1** |

1. The distribution for both populations showed a normal curve. State two features of a normal curve. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Any of the two:  68% of those test scores should fall within one standard deviation above or below the mean two standard deviations away from the mean should include 95% of the 100 test scores collected  three standard deviations away from the mean should represent 99.7% of the scores  The top of the curve shows the mean, mode, and median of the data collected | 1-2 |
| **Total** | **1** |

**Question 4 (13 marks)**

A psychologist wanted to test whether or not information could be consolidated while an individual was sleeping. She advertised in a local newspaper for participants aged between 18 and 20 years of age and sampled 100 applications by drawing their names out of a hat. The participants were exposed to two conditions.

The control condition involved participants reading a list of 50 countries when they woke up after a night’s sleep. Before going to bed the following evening, they were asked to write down as many countries as they could remember. The same participants were then used in the experimental condition, which involved participants reading a list of 50 cities from around the world before going to bed and then writing down as many cities as they could recall upon waking from sleep.

Statistical tests on the difference between the mean scores for the two groups found p > 0.05.

1. State the conclusions that the researchers could draw from the results.

(3 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| The probability that the results are due to chance is more than 5%   * Hypothesis is not supported * Results are not statistically significant * More than 5% possibility that the results were due to extraneous variables | 0-3 |
| **Total** | **1** |

1. Could the findings of this experiment be generalised to the population? Explain why or why not. (4 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| No  Not statistically significant  Sample is not representative of the population (due to volunteer sampling)  Extraneous variables no controlled | 0-4 |
| **Total** | **1** |

1. Explain what the difference between inferential statistic and a descriptive statistic is. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Descriptive statistics **summarize the characteristics of a data set**. Inferential statistics allow you to test a hypothesis or assess whether your data is generalizable to the broader population | 0-2 |
| **Total** | **1** |

1. Identify one inferential statistic and one descriptive. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Inferential – hypothesis test / p value  Descriptive – mean, median, mode, range | 1 |
| **Total** | **1** |

1. State one source of error in this study and suggest one **(1)** way that researchers could improve the research design to deal with this error (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Error: order effects  Resolve: independent groups or counter balancing | 1 |
| **Total** | **1** |

**Question 5 (10 marks)**

A psychologist was interested in the relationship between how strongly a person identifies with a particular ethnic group (ethnic identity) and their resilience to stress. The psychologist collected questionnaire measures of ethnic identity and resilience from 300 volunteer adults. The results of the study are shown in the scattergram below.

**

1. Explain why a researcher may initially conduct non-experimental research before conducting experimental research on a certain topic. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| To explore a topic and see if there is a relationship between two variables before setting up an experiment that explores cause and effect | 1 |
| **Total** | **1** |

1. State a research hypothesis that the psychologist could develop for this study. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| The stronger an individual’s ethnic identity the higher their resilience | 1 |
| **Total** | **1** |

1. Outline the difference between a research hypothesis and an operationalised hypothesis. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A researcher hypothesis makes a prediction between two variables an operationalized hypothesis tells the readers how the main variables are measured or put into effect. | 1 |
| **Total** | **1** |

1. Identify the strength and nature of the relationship between the two variables shown in the scatterplot. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Strong positive | 1 |
| **Total** | **1** |

The researchers wanted to design a quasi-experiment on this topic. The researchers used volunteer sampling to gather 46 participants with either a strong sense of ethnic identity or a weak sense of ethnic identity.

1. Operationalise resilience: (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| The amount of time taken to recover from stressful life situations | 1 |
| **Total** | **1** |

1. Outline the method of an experiment that could be used to for this research. (5 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Must mention:  how the two groups are catagorised, how DV is operationalized and measured  must have a task that would measure resilience  Example of a 5-mark response below:  Initial volunteer sampling where participants sign up and complete a survey to categories them as either having a strong sense of ethnic identity or weak sense of ethnic identity  Participants with a score of over 75% for sense of ethnic identity or under 25% for sense of ethnic identity are the two naturally occurring groups.  The participants are asked to complete a set of 5 different tasks which are purposefully impossible to complete and build frustration. The participants are given a prompted to continue by the researcher twice when they initially want to stop.  The amount of time it takes for the participant to give up is their measure of resilience. | 1  1  1  1  1 |
| **Total** | **1** |