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**Joseph Banks  
Secondary College**

**Research Methods and Biological Influences  
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**: thee minutes**

Working time for the paper: **sixty-one 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 | Percentage of test |
| Section One:  Research Methods | 2 | 20 |  | 20 | 50 |
| Section Two:  Short Answer | 3 | 41 |  | 43 | 50 |
|  |  | **Total** |  | 63 | 100 |

**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.

**Research Methods Section**

**Question One (11 marks)**

At a University, 40 first year Psychology students participated in a study examining the effects of trauma on working memory capacity. Students all took part in a working memory test.

a) Operationalise the independent variable (1 mark)

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b) Write an operationalised hypothesis for this study (4 marks)

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c) Quantitative data can be displayed through many different methods; however, some methods are better suited to certain data and situations than others.

For each of the following scenarios, identify which is the most appropriate quantitative display method and justify your choice. (6 marks)

i) Longitudinal data showing yearly changes in intelligence:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii) A series of medians and modes for a set of data:

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iii) The proportions of attitudes of 100 surveyed people: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Question Two (8 marks)**

Dr Almasi has been working with a young repeated offender named Yasmin, Yasmin has been undergoing various therapeutic techniques with Dr Almasi to try to rehabilitate her behaviour. Recently, they have been trialling the use of ADHD medication which has helped reduce Yasmin’s angry outbursts as measured by interviews, observations and self-report data.

Dr Almasi concluded that ADHD medication is an effective treatment for anger issues in teenagers.

a) Is this research scientific or non-scientific and why (1 mark)

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b) State the research design used for this type of research (1 mark)

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(c) Describe two main sources of error in this piece of research and how Dr Ahmasi cold overcome the research in the future. (2 mark)

|  |  |
| --- | --- |
| **Source of Error** | **Way to overcome it** |
|  |  |
|  |  |

d) State whether Dr Ahmasi’s research was ecologically valid and generalisable to a larger population and explain your reasoning. (4 marks)

i. Ecological validity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii. Generalisable to the larger population: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section Two**

**Question Three (26 marks)**

a) The human nervous system is a complex structure comprised of numerous structures and organs.

NERVOUS

SYSTEM

A)

D)

F)Autonomic

E)

C)

B)

H)

G)

Identify and describe the role of the nervous systems identified below: (*4 marks*)

D)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

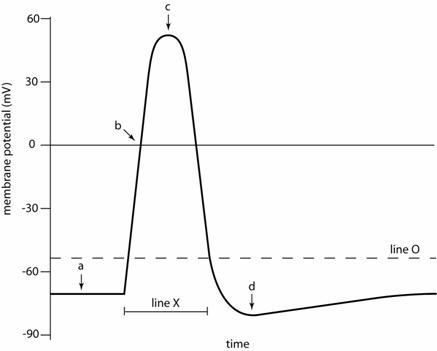
G)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Andy is excited as he gets ready to bungee jump from a platform above a rugged cliff. Describe how the autonomic nervous system is responding to the sensory information he is getting while in this excited state. (2 marks)

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c) Label the three parts of the graph below, using the labels provided. (3 marks)



|  |  |  |
| --- | --- | --- |
| Resting (polarised) | Hyperpolarised | Action Potential |

Part C: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Explain how a neural message crosses the synapse. Include an explanation of the processes of excitation and inhibition at the synapse. (5 marks)

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e) Tom is walking to his letterbox bare-footed. He does not notice the nail on the path and places his foot squarely on the sharp end. Explain Tom’s neural response fully in the space below, including why Tom *did not fall over* when he stood on the nail. Include all relevant terminology in your response. (6 marks)

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c) Explain why neurons have refractory periods. (1 marks)

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d) Explain at the ionic level what causes the refractory period. (2 marks)

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e) Muscular Sclerosis is a degenerative disease that deteriorates the myelin of the neuron and causes motor skills to become shaky and eventually. Using your knowledge of neural transmission and the nervous system explain why nerve impulses are not being received correctly. (3 marks)

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**Question Four (7 marks)**

After a motorcycle accident Saskia was left with a traumatic brain injury. Doctors notes that she was able to understand what was being communicated to her but she was unable to articulate words and sentences properly.

i. Identify the structure of the brain that is damaged (1 mark)

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ii. In the correct order identify and describe the functions of each of the structures of the brain that allow sound and language to be processed and communicated. (8 marks)

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**Question Five (11 marks)**

1. Name two neurotransmitters and state the main function it helps regulate (4 marks)

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| --- | --- |
| **Neurotransmitters** | **Effect of neurotransmitter** |
|  |  |
|  |  |

1. Sam is 29-year-old who is out partying with his friends, he accepts a drink from a stranger at the party and in around 30 minutes he starts to notice he doesn’t feel normal. His heart has started racing, his vision becomes shaky, the trees around him start to look like they have faces and the wind running through the leaves start to sound like they are speaking to him. He tries to explain to his friend what he is seeing and hearing to check if he is going crazy but as soon as his friend replies, it sounds like whale noises and Sam cannot understand him.

i. What class of psychoactive drug is Sam likely to be on? (1 mark)

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ii. Justify your answer to part (b)(i) using evidence from the scenario (2 marks)

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iii. Explain how psychoactive drugs which act agonistically to impact neural transmission (2 marks)

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(c) Neurotransmitters are not the only chemical message that impact our behaviour, thought and emotion. Identify one hormone and explain how it impacts our behaviour. (2 marks)

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