SCIENCE TEACHERS ASSOCIATION VICTORIA 2023

TRIAL EXAMINATION

QUESTION AND ANSWER BOOK

Total writing time:
1 hour 30 minutes

PSYCHOLOGY
UNIT 3

Student name	

Student ID									**Letter**	

Structure of book

Section	Number of questions	Number of marks
A	40	40
B	12	50
	Total	**90**

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculators are allowed in this examination.

Materials supplied

- Question and answer book of 25 pages, with a detachable answer sheet for multiple-choice questions inside the front cover.

Instructions

- Detach the answer sheet for multiple-choice questions during reading time.
- Write your name and student ID in the space provided above on this page and on the answer sheet for multiple-choice questions.
- All written responses should be in English.

At the end of the examination

- Place the answer sheet for multiple-choice questions inside the front cover of this book.

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SECTION A – Multiple-choice questions

Instructions for Section A

This section consists of 40 questions, each with four possible answers. Only one answer for each question is correct.

Select the answer you believe is correct and indicate your choice on the Multiple-Choice Answer Sheet by shading the corresponding letter. If you wish to change your answer, erase it cleanly and shade your new choice. No mark will be allocated if more than one answer is given for any question. Marks will not be deducted for incorrect answers.

Each question is worth one mark.

Question 1

The nervous system which integrates and coordinates all incoming afferent information and initiates voluntary efferent messages to the body is called the

A. peripheral nervous system.

B. central nervous system.

C. somatic nervous system.

D. autonomic nervous system.

Question 2

The enteric nervous system is located within the walls of the

A. gastrointestinal tract between the stomach and bowel.

B. digestive system between the stomach and bowel.

C. gastrointestinal tract between the oesophagus and rectum.

D. digestive system between the oesophagus and rectum.

Question 3

Sam Kerr, shown below right, is an Australian professional soccer player who plays for Chelsea in the Women's Super League. In order for her to kick the soccer ball, instructions about how to move her legs are first initiated by her _____ and communicated to her _____ by the _____.

A. brain, somatic nervous system, spinal cord.

B. central nervous system, spinal cord, brain.

C. peripheral nervous system, spinal cord, brain.

D. brain, central nervous system, spinal cord.

STAV
2023

PSYCHOLOGY
Unit 3 Trial Examination
MULTIPLE CHOICE ANSWER SHEET

STUDENT NAME:	

INSTRUCTIONS: **USE PENCIL ONLY**

- Write your name in the space provided above.
- Use a **PENCIL** for **ALL** entries.
- If you make a mistake, **ERASE** it – **DO NOT** cross it out.
- Marks will **NOT** be deducted for incorrect answers.
- **NO MARK** will be given if more than **ONE** answer is completed for any question.
- Mark your answer by **SHADING** the letter of your choice.

	ONE ANSWER PER LINE					ONE ANSWER PER LINE					ONE ANSWER PER LINE				
1	A	B	C	D	15	A	B	C	D	28	A	B	C	D
2	A	B	C	D	16	A	B	C	D	29	A	B	C	D
3	A	B	C	D	17	A	B	C	D	30	A	B	C	D
4	A	B	C	D	18	A	B	C	D	31	A	B	C	D
5	A	B	C	D	19	A	B	C	D	32	A	B	C	D
6	A	B	C	D	20	A	B	C	D	33	A	B	C	D
7	A	B	C	D	21	A	B	C	D	34	A	B	C	D
8	A	B	C	D	22	A	B	C	D	35	A	B	C	D
9	A	B	C	D	23	A	B	C	D	36	A	B	C	D
10	A	B	C	D	24	A	B	C	D	37	A	B	C	D
11	A	B	C	D	25	A	B	C	D	38	A	B	C	D
12	A	B	C	D	26	A	B	C	D	39	A	B	C	D
13	A	B	C	D	27	A	B	C	D	40	A	B	C	D
14	A	B	C	D										

Question 4

Putting on a jumper when you feel cold and throwing a tennis ball are both examples of _____ responses while sneezing because of dust in the air and blushing when embarrassed are examples of _____ responses.

A. involuntary, conscious.

B. voluntary, conscious.

C. unconscious, conscious.

D. conscious, unconscious.

Question 5

The motor function of the somatic nervous system can be demonstrated by

A. moving your hand away from a hot stove reflexively.

B. feeling heat when holding a cup of tea.

C. returning the body to a homeostatic stage.

D. feeling your heart rate increase following a fright.

Question 6

During learning, the dendrites of some nerve cells will release the neurotransmitter

A. GABA, which makes the postsynaptic neuron less likely to fire.

B. glutamate, which makes the presynaptic neuron more likely to fire.

C. dopamine, which excites the postsynaptic neuron.

D. glutamate, which makes the postsynaptic neuron more likely to fire.

Question 7

When someone experiences something that is rewarding, the brain tends to respond by releasing

A. dopamine, which results in mood stabilisation.

B. serotonin, which is involved in reward-based learning.

C. dopamine, which results in feelings of pleasure.

D. glutamate, which makes the postsynaptic neuron more likely to fire.

Question 8

What would be the impact on synaptic connections when sprouting occurs?

A. Growth of nerve endings on axons and or dendrites, enabling new connections to be made.

B. The elimination of weak and unused synapses.

C. Strengthening of synaptic connections enabling postsynaptic neurons to be more easily activated.

D. Growth of nerve endings enabling new connections to be made between neurotransmitters.

Question 9

Some neurotransmitters can have a modulatory effect in the nervous system, changing the reactivity of receptors to make them more or less potent.

Which of the following have modulatory effects?

A. GABA and glutamate.

B. serotonin and glutamate.

C. dopamine and GABA.

D. serotonin and dopamine.

Question 10

Which of the following correctly identifies a modification that would occur as a result of long term-potentiation (LTP) at the synapse?

A. The post-synaptic neuron becomes more sensitive in response to presynaptic neurotransmitter release because of additional receptor sites growing.

B. More neurotransmitters (glutamate) are released over time, as a larger amount is required to stimulate the post-synaptic neuron.

C. The pre-synaptic neuron becomes faster at detecting a signal, speeding up the firing of an action potential and more efficient communication overall.

D. The post-synaptic neuron becomes less sensitive in response to presynaptic neurotransmitter release because of a reduction in the number of receptor sites.

Question 11

The gut brain axis (GBA) involves direct and indirect pathways between the brain and gastrointestinal tract. Which one of the following is **not** true of the GBA?

A. The GBA is bi-directional.

B. The GBA is a communication link between the central and enteric nervous system.

C. Stress does not disturb the balance of the gut microbiota.

D. Disruption in the gut may affect mood, motivation and problem solving.

Use the following information to answer Questions 12 and 13.

Rita and Rohan were in a chemistry class completing a science experiment when a chemical spill activated the safety alarm. The class had to exit the room quickly. Rita was able to move quickly to the exit, however, Rohan panicked. He was surprised by his inaction and inability to think clearly.

Question 12

Which of the following identifies the type of response Rita and Rohan most likely had to the safety alarm.

A. Both Rita and Rohan experienced a freeze response.

B. Rita experienced a flight response, while Rohan experienced a freeze response.

C. Rohan experienced a flight response, while Rita experienced a fight response.

D. Both Rita and Rohan experienced a flight response.

Question 13

Rohan was likely experiencing

A. an inability to act due to parasympathetic dominance.

B. the fight-flight-freeze response, which is controlled by the somatic nervous system.

C. a heightened heart rate and stomach contractions due to the parasympathetic nervous system.

D. the countershock phase of the general adaptation syndrome.

Use the following information to answer Questions 14 to 19.

Layla and Ali attended the Royal Melbourne Show last year. Layla enjoyed patting the baby farm animals, while Ali enjoyed the various fast paced roller coaster rides.

Question 14

Which division of the nervous system is most dominant when Layla is patting the animals and when Ali is on a roller coaster ride?

	Layla	Ali
A.	somatic nervous system	sympathetic nervous system
B.	sympathetic nervous system	parasympathetic nervous system
C.	somatic nervous system	somatic nervous system
D.	autonomic nervous system	parasympathetic nervous system

Question 15

When Ali came out of the 'house of horrors' Layla noticed his pupils were still dilated. Which of the following physiological changes might Ali have experienced while inside the house of horrors.

A. increased digestion, decreased glucose secretion and regular heart rate.

B. decreased digestion, decreased glucose secretion and increased heart rate.

C. decreased digestion, increased glucose secretion and increased heart rate.

D. increased digestion, increased glucose secretion and increased heart rate.

Question 16

The physiological arousal Ali experienced while in the house of horrors is due to

A. the release of cortisol and the activation of the shock phase.

B. the release of adrenaline and the activation of the fight, flight, freeze response.

C. the release of adrenaline, slowing the somatic nervous system.

D. the release of cortisol and the activation of the sympathetic nervous system.

Question 17

Which of the following physiological changes might Ali experience a few minutes after the house of horrors ride?

	Physiological changes	Activated by
A.	increased digestion, decreased glucose secretion and regular heart rate	parasympathetic nervous system
B.	decreased digestion, decreased glucose secretion and increased heart rate	parasympathetic nervous system
C.	increased digestion, increased glucose secretion and increased heart rate	sympathetic nervous system
D.	decreased digestion, increased glucose secretion and increased heart rate	parasympathetic nervous system

Question 18

While at the animal farm, Layla commented on how soft the lamb's wool felt. Identify the correct sequence which would have allowed Layla to feel the soft wool.

A. efferent neurons to the central nervous system.

B. afferent neurons to the central nervous system.

C. sensory neurons to the peripheral nervous system.

D. afferent neurons to the autonomic nervous system.

Question 19

While feeding the animals, Layla experienced an immediate withdrawal response after one of the chickens pecked at her hand. Which one of the following is the correct response and description for this situation?

	Type of response	Description
A.	withdrawal response	Is an immediate response at the spine which enables a faster reaction time.
B.	spinal reflex	Occurs a second after the sensory information reaches the brain.
C.	reflex arc	Important in minimising harm, and maximising the fight, flight, freeze response.
D.	spinal reflex	Occurs at the spinal cord and is considered adaptive as it saves time in situations that may be very harmful to the organism.

Use the following information to answer Questions 20 to 23.

Stavros lives in a share house with two other people. He is in his final year of studying medicine and works part time at a nursing home. Stavros often complains of being sleep deprived. Most days Stavros lacks sleep due to the demands of his studies and late-night gatherings at his house.

Question 20

Which of the following are examples of internal and external stressors Stavros may be experiencing?

	Internal stressors	External stressors
A.	contracting covid	noisy household from gatherings
B.	working at the nursing home	sleep deprivation
C.	noisy household from gatherings	late night studies
D.	sleep deprivation	late night studies

Question 21

The ongoing demands of his studies and lack of sleep has meant that Stavros is likely experiencing

A. tonic immobility.

B. chronic stress.

C. alarm reaction stage of stress.

D. acute stress.

Question 22

Due to the prolonged exposure to stress, Stavros would likely have increased levels of

A. adrenaline.

B. GABA.

C. dopamine.

D. cortisol.

Question 23

Which of the following is not a function of the primary stress hormone likely circulating in Stavros's bloodstream

A. maintains homeostasis.

B. vulnerability to heart disease.

C. impaired immune system functioning.

D. vulnerability to cold and flu.

Question 24

According to the behaviorist approach to learning, learning is said to have occurred when

A. a particular response produces a stimulus it did not previously produce.

B. an association between a neutral stimulus and a conditioned stimulus produces a conditioned response.

C. a particular stimulus produces a response that it did previously produce.

D. an association between a neutral stimulus and an unconditioned stimulus produces a conditioned response.

Question 25

Benji the cat purrs whenever it hears the microwave beeping sound as it has learnt to anticipate food. In this scenario the stimulus that consistently produced a naturally occurring response is the

A. neutral stimulus.

B. purring.

C. microwave beeping.

D. food.

Use the following information to answer Questions 26 to 28.

A beer commercial features beautiful people enjoying a beer while frolicking on a warm beach, socialising with friends. The producers hope that the viewers will associate the can of beer with the unconditioned stimulus that elicits a positive emotional response.

Question 26

What is the neutral stimulus in the above example?

A. the positive emotional response.

B. the pleasant scene.

C. the can of beer.

D. the beautiful people.

Question 27

What is the unconditioned stimulus in the above example?

A. the positive emotional response.

B. the pleasant scene.

C. the can of beer.

D. the pleasant scene with the beautiful people.

Question 28

According to the three-phase model, when will the beer alone elicit a positive emotional response?

A. after the conditioning phase.

B. during the conditioning phase.

C. before the conditioning phase.

D. during the antecedent conditioning phase.

Use the following information to answer Questions 29 to 30.

Sasha lives in an apartment block with her dog Bruce. Bruce barks frequently at night, often disturbing the neighbours on her floor. To prevent Bruce from barking, Sasha purchased a collar which sprays an unpleasant but harmless scent onto Bruce's nose whenever he barks. Three days after the collar was fitted, Bruce stopped barking throughout the night.

Question 29

In this scenario, the antecedent, behaviour, and consequence respectively for Sasha are

A. purchasing a collar, being sprayed with an unpleasant scent, barking throughout the night.

B. barking throughout the night, purchasing a collar, being sprayed with an unpleasant scent.

C. barking throughout the night, being sprayed with an unpleasant scent, purchasing a collar.

D. purchasing a collar, barking throughout the night, being sprayed with an unpleasant scent.

Question 30

The unpleasant scent being sprayed onto Bruce's nose is a _____ because it has the effect of _____.

A. positive punishment, decreasing the behaviour.

B. negative reinforcer, increasing the behaviour.

C. negative reinforcer, decreasing the behaviour.

D. negative punishment, increasing the behaviour.

Question 31

Philippa remembers seeing her sister lose her favourite teddy bear as a result of hanging it out of a car widow. Since the incident Phillipa has never put anything out of the window of a moving vehicle. In this example Philippa has observed _____; and has been _____ not to repeat her sister's behaviour.

A. modelling, vicariously conditioned.

B. reinforcement, punished.

C. punishment, classically conditioned.

D. reinforcement, vicariously conditioned.

Question 32

During operant conditioning, the learner is _____ ; whereas during classical conditioning the learner is _____ .

A. passive, active.

B. reinforced, not reinforced.

C. active, passive.

D. not reinforced, reinforced.

Question 33

While Liza was watching a TV show, her brother asked her a question. Liza thought she hadn't heard what was said. When she was about to ask her brother to repeat the question, Liza was able to 'hear' what her brother had asked and answered his question.

This effect is due to

A. sensory iconic memory.

B. short-term iconic memory.

C. sensory echoic memory.

D. short-term memory.

Question 34

Lina and Rosa were recently in a car crash. Lina sustained damage to her hippocampus, while Rosa sustained damage to her amygdala. Rosa is most likely experiencing difficulty with _____, while Lina is most likely experiencing difficulty with _____.

	Rosa	Lina
A.	explicit memory	new long-term memories
B.	sematic memory	episodic memories
C.	sensory memory	semantic memory
D.	implicit memory	new long-term memories

Question 35

Comedians will often deliver a stand-up comedy show for 90 minutes. It has been said that one way they remember the order of their set is by visually linking a sequence of locations within the theatre to their memory and visually linking these locations with the jokes that need to be recalled. This technique is referred to as

A. songlines.

B. the method of loci.

C. a mnemonic device.

D. an acrostic.

Question 36

Alzheimer's disease is associated with low levels of the neurotransmitter _____; and the presence of _____, which inhibit communication between neurons and _____, which inhibit communication within neurons.

A. GABA, neurofibrillary tangles, amyloid plaques.

B. GABA, amyloid plaques, neurofibrillary tangles.

C. acetylcholine, amyloid plaques, neurofibrillary tangles.

D. acetylcholine, neurofibrillary tangles, amyloid plaques.

Question 37

Songlines are a mnemonic device

A. that involves verbal associations for items remembered by constructing sentences, songs and phrases.

B. that uses mental images with information that needs to be remembered and associate them with specific positions or locations.

C. that uses pronounceable words formed from the first letters of a group of words to enhance memory recall.

D. that uses the locations and features of significant landscapes and at each location, a story, dance or ceremony is performed associated with that particular location.

Question 38

Kylie is thinking about her first day of primary school. She recalls meeting her best friend that day and remembers her teacher's name, Mr Bradley. These are a type of memory referred to as

A. autobiographical memory.

B. episodic memory and procedural memory.

C. semantic memories.

D. procedural and semantic memory.

Question 39

During a relaxation exercise, Jolie was asked to close her eyes and imagine walking on a white sandy beach. Jolie found this task difficult to do and reported that she could not form any mental images of this scene. Jolie is likely experiencing

A. Aphantasia, a neurodegenerative disorder characterised by the gradual widespread degeneration of brain neurons.

B. Alzheimer's, the inability to see anything in her 'mind's eye'.

C. Aphantasia, the inability to see anything in her 'mind's eye'.

D. Alzheimer's, a neurodegenerative disorder characterised by the gradual widespread degeneration of brain neurons.

Question 40

Studies of patients with Alzheimer's disease have found significant impairments when patients are asked to imagine the future or mentally construct a hypothetical event.

The ability to construct a possible imagined future is most reliant on which type of memory?

A. working memory.

B. episodic memory.

C. semantic memory.

D. procedural memory.

END OF SECTION A

SECTION B

Instructions for Section B

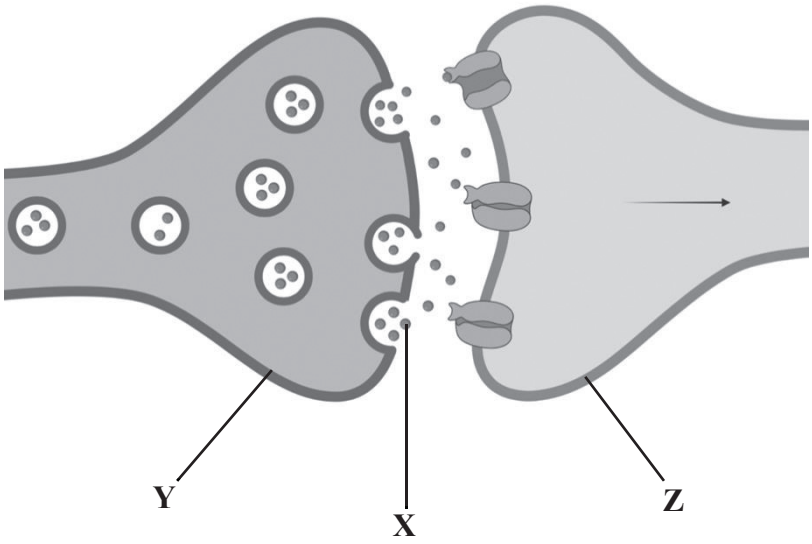
Answer **all** questions in the spaces provided.

Use the command / task words, other instructional information within questions and corresponding mark allocations to guide the content and length of your responses.

Section B is worth 50 marks.

Question 1 (5 marks)

The diagram below illustrates the likely neural transmission occurring while Jiang is learning to play the violin.



a. Explain the diagram above by identifying each structure. Outline with reference to Jiang, the process of neural transmission when X is released from structure Y and the effect it will have on the receiving structure Z.

_____

_____

_____

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_____

_____

_____

3 marks

b. With reference to neural circuits, describe two synaptic modifications that occur to structures Y and Z due to sprouting while Jiang practices playing the violin.

2 marks

Question 2 (1 mark)

Long-term potentiation (LTP) and long-term depression (LTD) have opposite outcomes. Describe one similarity between them.

Question 3 (3 marks)

Contrast **two** characteristics of neuromodulators and neurotransmitters. In your response name one inhibitory neurotransmitter and one neuromodulator.

Question 4 (10 marks)

Koray and Cindy love to preform and have dreams of becoming professional dancers. For weeks they have been practising a dance routine which they will use to audition for a talent show. Recently Cindy twisted her ankle and has been unable to attend a few days of rehearsal. This has impacted her preparation and Cindy has begun to feel increasingly stressed. Koray, however, has not been worried and feels confident that they have both prepared well. He thinks that some rest time might re-energise them both and benefit their upcoming audition.

a. In terms of the flight-or-fight-or-freeze response, describe **two** adaptive changes that would occur when Koray and Cindy are nervously auditioning in front of a panel of judges **and** identify the nervous system which is dominant during the audition.

_____

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3 marks

b. According to Lazarus and Folkman's Transactional Model of Stress and Coping, how did Koray primarily appraise the situation?

_____

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2 marks

c. A week after their audition, Cindy becomes ill and must stay in her bed for a week to rest and recovery. With reference to the GAS model, explain what stage of GAS Cindy is currently likely to be in. Justify your response.

_____

_____

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2 marks

d. According to the GAS model, when is cortisol released? With reference to an example describe one positive effect of its release on Koray and Cindy.

_____

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2 marks

e. Why might the GAS model be a limited explanation for why Cindy became ill?

_____

_____

_____

_____

1 mark

Question 5 (3 marks)

Travis is feeling stressed as he is waiting on blood test results after complaining of chronic pains. He decides to go for a run to keep himself occupied while he waits for his blood test results. Evaluate if exercise would be a successful coping strategy with context-specific effectiveness for Travis. Include the type of coping strategy used.

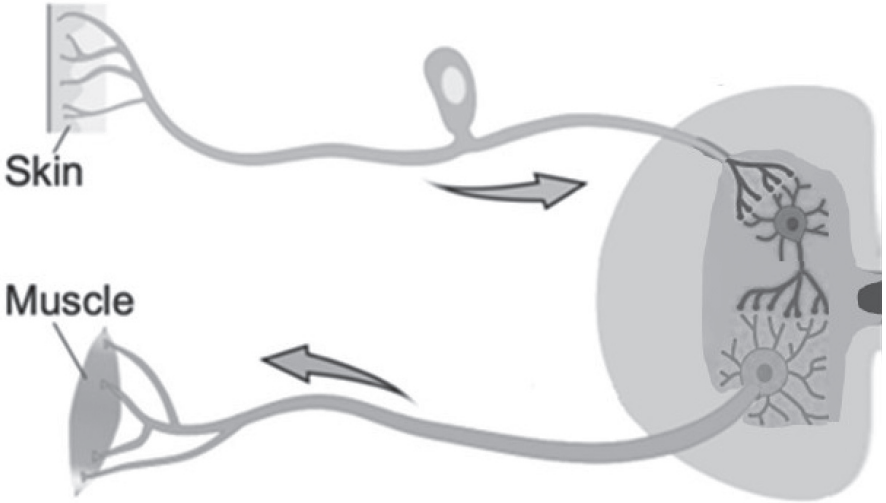
Question 6 (2 marks)

Explain the relationship between stress and the gut-brain axis.

Question 7 (1 mark)

Identify one difference between acute stress and chronic stress.

Question 8 (4 marks)



a. Explain why the diagram above is described as an adaptive function?

1 mark

b. Explain the above diagram by writing a detailed example of what may be causing this response. Refer to key terms.

3 marks

Question 9 (10 marks)

Adapted from the study: **'Lines of communication: How Indigenous knowledge can improve the memory.'**

Dr Yunkaporta and Dr Reser decided to compare the method of loci and the indigenous memory techniques by asking 76 first-year medical students attending Monash University to memorise a list of 20 common butterfly names. The students were randomly divided into two groups:

Group 1 – Dr Reser spent 20 minutes instructing one group in the method of loci technique, asking the students to reconstruct their childhood bedroom.

Group 2 – Dr Yunkaporta taught the Aboriginal technique, using a small garden on the campus. He walked the students around the space and told them a story linking the garden's features – the students attached a butterfly name to each of the features as they walked. Their training time was also 20 minutes.

Group 3 – was simply given a list of words and asked to memorise it in their own way.

All the students were tested at 10 minutes, and then 30 minutes after the completion of the activity.

The researchers found that the students who used the Aboriginal technique were almost three times more likely to remember the entire list than the control group. The students using the method of loci were about twice as likely to get a perfect score after training.

A follow-up study was undertaken six weeks after the initial experiment, but only eight students participated – not enough to provide a meaningful result. "But it did tell us that both techniques need to be practised. Otherwise, the information gets lost." said Dr Reser.

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a. Write a possible research hypothesis for the Monash University investigation.

_____

_____

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3 marks

b. Identify the experimental design used in this study. Justify your response.

_____

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1 mark

c. Explain one advantage of the experimental design used in this study.

_____

_____

1 mark

d. Name and explain one ethical guideline that would be required to conduct the study.

_____

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2 marks

e. "… both techniques need to be practised, otherwise, the information gets lost." What process does this quote support?

_____

1 mark

f. Suggest one possible extraneous variable in this study and how it could be controlled.

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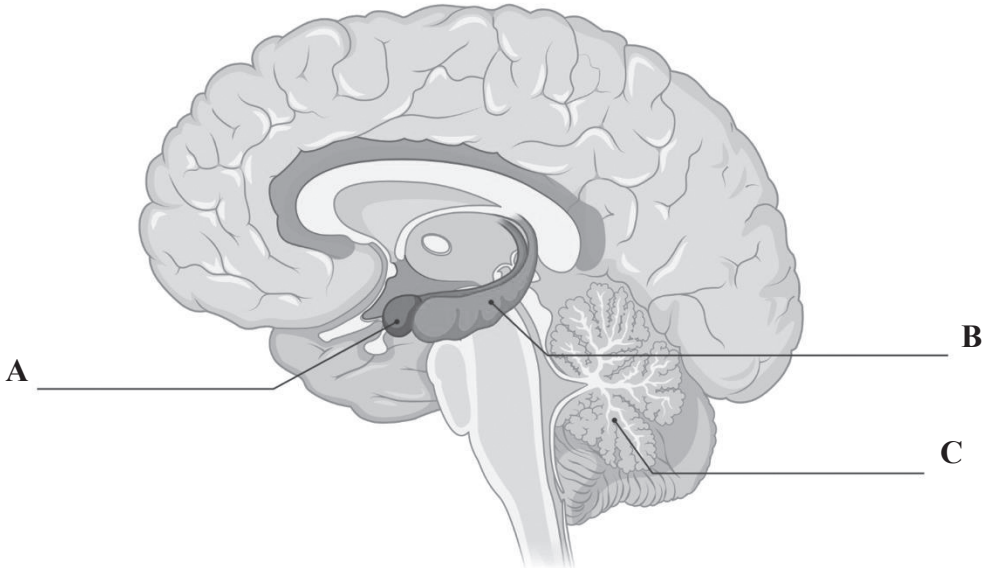
2 marks

Question 10 (5 marks)

The diagram below shows the brain structures involved in long-term implicit and explicit memory.



a. Identify structure B in the diagram above **and** explain what role it plays in long term memories of people with Alzheimer's disease.

_____

_____

_____

_____

_____

2 marks

b. Ben has a fear of birds after being swooped by a magpie when he was a young boy. Identify the correct structure most likely involved in this fear response.

_____

1 mark

c. Identify structure C in the diagram above and provide **two** examples of implicit memories that might be encoded by this structure.

_____

_____

_____

_____

_____

2 marks

Question 11 (3 marks)

Every morning before going to school, Sunita's mother nags her to clean her room and make her bed. After a week of nagging, Sunita cleans her room and makes her bed to make her mother's nagging stop. Apply the three-phase model of learning associated with Sunita eventually choosing to clean her room and state how this learning principle encouraged Sunita's behaviour.

_____

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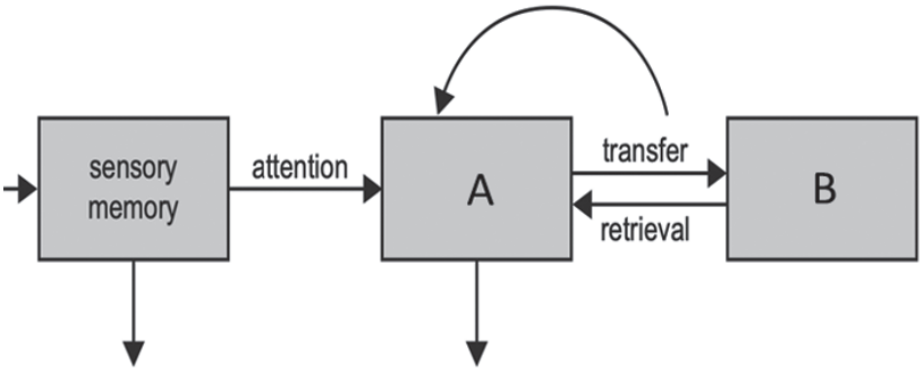
Question 12 (3 marks)

Evaluate the explanatory power of the Atkinson-Shiffrin model of memory in encoding, storage and retrieval of information. In your response include a description of the capacity, duration, and examples of the types of memories at store A and B shown in the diagram below.



Source: adapted from P Shrestha, 'Types of Memory', in Psychestudy, 17 November 2017 <www.psychestudy.com/cognitive/memory/types>

END OF TRIAL EXAMINATION

Extra space for responses

Clearly number all responses in this space.