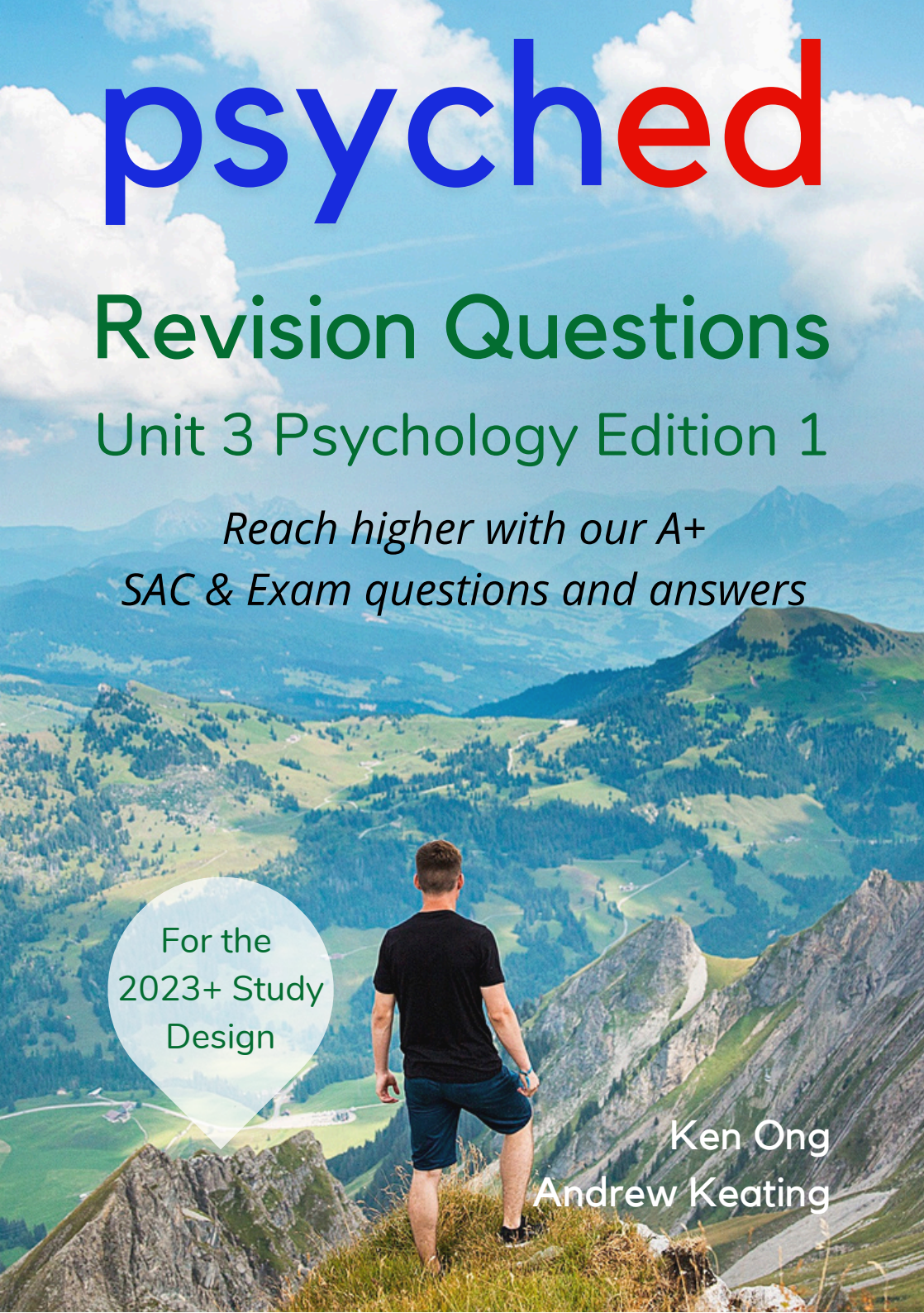


The background of the entire cover is a photograph of a person standing on a grassy mountain peak, looking out over a vast, green valley with rolling hills and distant mountains under a blue sky with white clouds. The person is seen from behind, wearing a black t-shirt and dark shorts.

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Revision Questions

Unit 3 Psychology Edition 1

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For the
2023+ Study
Design

Ken Ong
Andrew Keating

Psyched Revision Questions

Unit 3 Psychology Edition 1

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Area of Study 1: How does the nervous system enable psychological functioning?

On completion of this unit the student should be able to analyse how the functioning of the human nervous system enables a person to interact with the external world, and evaluate the different ways in which stress can affect psychobiological functioning.

Chapter 1: Nervous system functioning

Rate each Study Design dot point a ☺, ☹ or ⊗

☺ = I know everything about it and could explain it to someone

☹ = I know most things, but would struggle to explain it to someone

⊗ = I don't know much about it

VCAA Psychology Study Design Key Knowledge:

- the roles of different subdivisions of the central and peripheral nervous systems in responding to, and processing and coordinating with, sensory stimuli received by the body to enable conscious and unconscious responses, including spinal reflexes
- the role of neurotransmitters in the transmission of neural information across a neural synapse to produce excitatory effects (as with glutamate) or inhibitory effects (as with gamma-amino butyric acid [GABA]) as compared to neuromodulators (such as dopamine and serotonin) that have a range of effects on brain activity
- synaptic plasticity – resulting from long-term potentiation and long-term depression, which together act to modify connections between neurons (sprouting, rerouting and pruning) – as the fundamental mechanism of memory formation that leads to learning

Question 18

Veronica was about to give a speech at her best friend's 21st birthday party. She wants to give the speech, but as she is always nervous with public speaking, Veronica has written some key points on cue cards to help her with the stories that she wants to tell in her speech. Identify the division of Veronica's nervous system that would be most active just before giving the speech and one physiological change associated with this division of the nervous system.

	Division of the nervous system	Physiological change
A.	central nervous system	dilated pupils
B.	sympathetic nervous system	decreased heart rate
C.	sympathetic nervous system	slowing of digestion
D.	parasympathetic nervous system	increased heart rate

Question 19

_____ are the branch-like structures that receive messages from other neurons.

- A. Synapses
- B. Axons
- C. Dendrites
- D. Neurotransmitters

Question 20

Which of the following is true of neurotransmitters?

- A. neurotransmitters can bind to any receptor site; the neurotransmitter then passes through a neuron before being released into the synaptic cleft
- B. neurotransmitters can bind to any receptor site, and are responsible for the communication of a neural message between neurons
- C. neurotransmitters bind to receptor sites that are specific to that type of neurotransmitter; the neurotransmitter then passes through a neuron before being released into the synaptic cleft
- D. neurotransmitters bind to receptor sites that are specific to that type of neurotransmitter, and are responsible for the communication of a neural message between neurons

Question 45 (4 marks)

James likes to jog outside whenever he feels stressed. Outline one role of each of the following components of James' nervous system while he is jogging.

Brain:

Spinal Cord:

Somatic nervous system:

Autonomic nervous system:

Question 46 (5 marks)

After a busy day at uni, Riku is at home preparing dinner. Whilst doing this, he accidentally touches a hot stove with his right hand. He involuntarily withdraws his hand from the hot surface and places his hand in a bucket of cold water. He is able to recover quickly and carry on with his preparations.

Describe the sequence of neuronal events that would take place in Riku's nervous system to explain why he withdraws his hand from the hot surface very quickly and with little effort.

Question 121

Linda was at a dinner party where they served oysters. She loves oysters, so had a few. Afterwards, she felt ill and had never been able to eat an oyster again. Which classical conditioning terms match the following elements from Linda's learning?

	Oysters	Feeling ill
A.	unconditioned stimulus	conditioned stimulus
B.	unconditioned response	conditioned response
C.	neutral stimulus	conditioned stimulus
D.	neutral stimulus	unconditioned response

Question 122

Aki's doctor suggests that Aki should take up jogging regularly as a means of reducing his stress. Aki notices that he becomes less stressed the more he jogs. This encourages Aki to jog more regularly. In terms of operant conditioning, what type of consequence is Aki experiencing from jogging?

- A. positive reinforcement
- B. negative reinforcement
- C. positive punishment
- D. negative punishment

Use the following information to answer Questions 123 and 124.

Isabelle is in Grade 1 and her teacher has asked her to read aloud to her parents each night. Her teacher has given her a record book and some gold star stickers to take home to her parents. Every time Isabelle completes her reading, her parents have been asked to put a gold star in Isabelle's record book. Isabelle loves the stickers and wants to collect a gold star every night.

Question 123

In terms of operant conditioning for Isabelle, her parents putting gold stars in her record book would be considered

- A. the antecedent.
- B. the behaviour.
- C. positive reinforcement.
- D. negative reinforcement.

Use the following information to answer Questions 141-143.

Gerald and his younger sister Rita live on a cattle farm. When Rita was young, her farm had a faulty electric fence and bulls would often wander into the paddock where she had a set of swings. She had many experiences of playing on the swings and suddenly having a bull charge towards her, which upset her greatly. By the time she was four years old, she felt terrified any time she was near the swing set and refused to play on it any longer. After the bulls ran into the play area, Gerald would try to fix the electric fence without his parents' assistance. Gerald was often electrocuted by the fence when he reached for it and he quickly learnt to stop touching the electric fence, seeking the help of an adult.

Question 141 (3 marks)

Using the language of classical conditioning, explain the process by which Rita acquired her fear of the swing set.

Question 142 (3 marks)

Has Gerald learnt not to touch the electric fence through a process of classical conditioning or operant conditioning? Provide two pieces of evidence from the scenario that justify your answer.

Question 175

In which part of Jennifer's brain is the memory of the new serving technique likely to be consolidated?

- A. amygdala
- B. cerebellum
- C. hippocampus
- D. substantia nigra

Question 176

Which of the following options accurately outlines the role of the hippocampus, amygdala, and neocortex in the process of memory?

	Hippocampus	Amygdala	Neocortex
A.	responsible for the encoding of short-term memory into long-term memory	assists with the consolidation of emotionally arousing memories	stores explicit memory
B.	stores explicit memory, and some implicit memories	responsible for the encoding of short-term memory into long-term memory	encodes and stores all implicit memories
C.	assists with the consolidation of emotionally arousing memories	encodes and stores all implicit memories	responsible for the encoding of short-term memory into long-term memory
D.	responsible for the encoding of short-term memory into long-term memory	encodes and stores all implicit memories	stores explicit memory, and some implicit memories

Question 177

With regards to implicit and explicit memories, which of the following is correct?

	Implicit memory	Explicit memory
A.	stored in the amygdala	formed in the hippocampus
B.	stored in the amygdala	stored in the cerebral cortex
C.	may be formed in the cerebellum	formed in the hippocampus
D.	may be formed in the cerebellum	stored in the hippocampus

Question 197 (2 marks)

A researcher was interested in testing the effects of Alzheimer’s disease on memory recall. Participants learnt a list of 20 words and were then asked to immediately recall them. Time 1 and 2 were six months apart, and involved participants recalling a new list of 20 words each time.

Percentage of words correctly recalled

	People with Alzheimer’s disease	Healthy elderly people
Time 1	40%	61%
Time 2	34%	63%

Explain the difference in results between the two groups, with reference to a type of amnesia and the brain region primarily involved.

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Chapter 5: Unit 3 Trial Exam

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STUDENT NUMBER

Letter

PSYCHOLOGY

Written examination

Reading time: 10 minutes

Writing time: 1 hour 40 minutes

QUESTION AND ANSWER BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of marks
A	35	35	35
B	12	12	45
			Total 80

- 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 calculator is allowed in this examination.

Materials supplied

- Question and answer booklet.

Instructions

- Write your student number in the space provided above on this page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

Question 241 (4 marks)

Using Lazarus and Folkman's Transactional Model of Stress and Coping, describe the reason why Dylan felt stressed, but able to cope with the pressures of his exams.

Question 242 (6 marks)

With reference to Selye's General Adaptation Syndrome, the fight-flight response, and the role of cortisol, explain Dylan's initial biological response to his mother's diagnosis of Parkinson's disease, and the stage Dylan was in when he had an open discussion with his mother about her diagnosis.

Question 245 (3 marks)

Outline how sung narrative may increase the encoding, storage, and retrieval of information.

Question 246 (4 marks)

Fabia is a naughty child and her parents are trying to teach her proper manners. Each time she says 'please' and 'thank you' at meal time, she receives a gold star on a chart, but every time she hits her brother at the table, one star is removed from the chart. Once she has received 15 gold stars, she is given a chocolate.

With reference to the three-phase model of operant conditioning, explain the rationale for using the star chart to help Fabia change her behaviour.

Chapter 6: Answer Guide

Nervous system functioning

- 1 C The autonomic nervous system includes the parasympathetic nervous system and the sympathetic nervous system.
- 2 D The sympathetic nervous system is responsible for the fight-flight response.
- 3 A Heat from the cup is detected by sensory receptors in Tony's fingers, which are part of the somatic nervous system. Sensory signals are sent to the central nervous system for processing, where Tony decides that the cup is too hot to hold comfortably. Motor information is then sent from the central nervous system to the skeletal muscles, via the somatic nervous system, to put the cup down.
- 4 D The hand-withdrawal reflex is an unconscious response because the action occurs before any awareness (e.g., of the heat of a hot pot) and is initiated by the spinal cord (not the spine, which refers to the vertebrae that enclose the spinal cord).
- 5 A While the brain is responsible for all mental processes and almost all behaviours, the spinal cord is responsible for initiating the behaviour of the spinal reflex.
- 6 B During a spinal reflex response, sensory neurons carry information from sensory receptors to the spinal cord, where interneurons immediately send an appropriate message to motor neurons to quickly respond. This response would occur without conscious awareness.
- 7 D Glutamate is the main neurotransmitter associated with learning. It is an excitatory neurotransmitter that plays a vital role in long-term potentiation.
- 8 D Pat's physiological reaction was caused by the activation of his (sympathetic nervous system, governed by the autonomic nervous system, which increased his heart rate and caused him to sweat.
- 9 B As the response of Georgia withdrawing her foot is a spinal reflex, receptors in the sole of her foot send sensory information to her spinal cord, which then processes that information and sends a motor message to the muscles in her foot and leg to withdraw from the sharp object.
- 10 C Georgia's reflex response was involuntary as it did not require conscious awareness.
- 11 C The sympathetic nervous system is the branch of the autonomic nervous system that prepares the body to deal with a threat.
- 12 D The sympathetic nervous system is responsible for activating the body in order to deal with a threat, which would involve dilated pupils (to enable the threat to be seen easier) and dilated bronchi in the lungs (to enable more oxygen and energy to be metabolised to deal with the threat). A relaxed bladder, slowed heart rate, constricted bronchi, and constricted pupils are signs of parasympathetic nervous system dominance.
- 13 C The spinal reflex involves a simple involuntary response that is initiated by the spinal cord. This response is initiated before the signal reaches the brain.
- 14 C The afferent (sensory) pathway of the somatic nervous system sends messages from the sensory receptors in the skin to the brain (in the CNS) to be processed. Note that option B is incorrect as this would be a task performed by the autonomic nervous system.
- 15 D An increase in heart rate is due to the activation of the sympathetic nervous system.
- 16 B A reflex is an involuntary, unconscious response that occurs in response to a stimulus (loud noise).
- 17 A The two major divisions of the peripheral nervous system are the somatic and autonomic nervous systems.

Question 41 (4 marks) One mark for each of the following points:

- *Max's sensory receptors, particularly (photoreceptors) in his eyes, would receive the image of a ball coming towards him.*
- *This message is sent via sensory neurons (up the afferent pathway) to the central nervous system.*
- *The brain (part of the central nervous system) processes this message and decides how to hit the ball.*
- *This motor message is sent through motor neurons (via the efferent pathway) down to his skeletal muscles to enable Max to hit the ball back towards his opponent.*

Question 42 (2 marks)

Central nervous system - either of the following points:

- *Priya would coordinate the movement in her central nervous system (brain).*
- *Priya would transmit the motor signals required for making the movement down her spinal cord.*

Somatic nervous system:

- *The somatic nervous system would carry the motor signal from the spinal cord to the relevant skeletal muscles required to make the kicking movement.*

Question 43 (2 marks) One mark for any of the below points, to a maximum of two:

- *The neuron may prune back (have fewer) dendritic spines.*
- *The neuron may prune back (have fewer) receptor sites.*
- *The neuron may prune back (have fewer) axon terminals.*
- *The neuron may produce and release fewer neurotransmitters.*

Question 44 (2 marks) One mark for each of the following points:

- *Long-term potentiation would have occurred when Jarrod practised playing the guitar regularly, as it would have strengthened the neural pathways that are involved in playing the guitar. (This would make it easier for him to play a range of songs on his guitar effortlessly.)*
- *Long-term depression would likely be the reason why Jarrod is unable to remember how to play the songs he had learnt many years later. The neural pathways involved in playing the guitar songs would have weakened (due to repeated low intensity stimulation of the post-synaptic neuron).*

Question 45 (4 marks) A maximum of one point for each subheading, for a total of four marks:

Brain (or any other legitimate answer):

- *James' brain would be coordinating the muscle movement required for running.*
- *James' brain processes the sensory data from his sensory organs as he runs.*
- *James' brain would be focusing his attention on the task of running.*

Spinal cord:

- *James' spinal cord would be carrying sensory (afferent) information towards the brain.*
- *James' spinal cord would be carrying motor (efferent) information to his skeletal muscles.*

Somatic nervous system:

- *James' somatic nervous system would be responsible for sending sensory (afferent) information, such as the pressure of the path against his feet, towards the brain.*
- *James' somatic nervous system would be responsible for sending motor (efferent) information, such as the signals regarding how to move his feet, from the brain to the skeletal muscles.*

Autonomic nervous system:

- *James' autonomic nervous system would be increasing his level of physiological arousal (such as increased heart rate, breathing rate, etc.) to allow his body to deal with the demands of running.*

Question 247 (10 marks) Sample A+ answer:

- *Observational learning is a method of social learning, which involves watching the actions and consequences of a model's behaviour and using this to guide future behaviour.*
- *When Daniel watched his mother play tennis as a child (and often win) he used this to guide his own behaviour (a form of observational learning).*
- *Learning through observation involves a sequence of processes: attention, retention, reproduction, motivation and reinforcement. All are essential if observational learning is to occur.*
- *First, the learner (Daniel) must pay active attention to the model; in this case, Daniel's mother as she played tennis.*
- *Next is retention, where Daniel must remember how to swing the tennis racquet to hit the ball and create a mental representation of this.*
- *This is followed by reproduction, where he must have both the physical and mental ability to swing the tennis racquet at the appropriate time.*
- *Motivation refers to having the desire to perform the behaviour; in this case, it was to perform the tennis swing in Daniel's PE class in the hope of praise from his PE teacher or his classmates.*
- *Reinforcement could have been given through the high-five from his PE teacher, or could have occurred vicariously when seeing his mother play and win her games, which would encourage Daniel to repeat this behaviour in future.*
- *The effectiveness of observational learning is enhanced when a model is reinforced (such as when Daniel's mother won her games), perceived positively, respected, and familiar to the observer. This is the case when Daniel watches his mother play tennis and would have increased the likelihood of the success of the observational learning.*
- *Neural plasticity refers to our brain being able to change due to experience, and is the biological basis of learning. These changes can be observed as multiple neurons connect to form neural pathways as a result of experience, such as practising a tennis swing.*
- *Long-term potentiation (LTP) refers to the long-lasting strengthening of new synaptic connections. Specifically, it refers to the ability of two neurons — a presynaptic and a postsynaptic neuron — to communicate more effectively with one another at the synapse. The more frequently they communicate, the more this connection is enhanced and strengthened. This can be seen through the increased release of neurotransmitters, increased amount of receptor sites, and the sprouting of dendritic spines/axon terminal branches, leading to a greater number of synapses (known as synaptogenesis) between the presynaptic and postsynaptic neurons.*
- *In Daniel's case, LTP would have occurred while watching his mother play tennis, and then strengthened further over the weeks that his PE teacher helped him to refine his tennis swing. Stimulation of the neural pathways and synaptic connections responsible for the tennis swing would have progressively strengthened these pathways and connections, as Daniel continued to practice.*
- *On the other hand, long-term depression (LTD) refers to a long-lasting weakening of synaptic connections that occurs if there is repeated low-intensity (sub-threshold) stimulation of the postsynaptic neuron. This can be seen through a decreased release of neurotransmitters, decreased amount of receptor sites, and the pruning of synapses.*
- *LTD would have occurred as any errors in Daniel's swing technique were weakened through the lack of stimulation of the neural pathways responsible for these errors. A lack of practice of these errors would lead to a progressive weakening of the synaptic connections responsible for these errors.*
- *Both LTP and LTD are important in the learning process. LTD is important so that the pruning of unimportant and unwanted connections can occur, leaving only the important connections that*

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