

**YEAR 12 *Trial Exam Paper***

**2017**

**PSYCHOLOGY**

**Written examination**

***Sample responses***

**This book presents:**

- high-level sample responses
- explanatory notes
- mark allocations
- tips

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**SECTION A – Multiple-choice questions****Question 1**

**Answer: B**

**Explanatory notes**

Options A, C and D are incorrect because the brain is not involved in a spinal reflex.

Option B is correct because the question describes a spinal reflex in which the brain is not involved.

**Question 2**

**Answer: C**

**Explanatory notes**

Option A is incorrect because electrical signals are carried within neurons.

Option B is incorrect because chemical signals are carried between neurons.

Option C is correct because neural impulses take the form of electrical signals within neurons and are transmitted between neurons as chemical signals (chemical messengers).

Option D is incorrect because electrical signals are carried within neurons and chemical signals are carried between neurons.

**Question 3**

**Answer: A**

**Explanatory notes**

Option A is correct because the neurotransmitter is the key, the receptor site is the lock and the post-synaptic neuron can be either inhibited or excited.

Option B is incorrect because the neurotransmitter is the key and the receptor site is the lock.

Option C is incorrect because the neurotransmitter is released by the pre-synaptic neuron (not the post-synaptic neuron) and is received by the post-synaptic neuron (not the pre-synaptic neuron).

Option D is incorrect because neurotransmitters can either inhibit or excite the post-synaptic neuron.

**Question 4****Answer: D****Explanatory notes**

Options A and B are incorrect because Penelope's behaviour of drinking wine is increasing, not decreasing (punishment would decrease the likelihood of the behaviour being repeated).

Option C is incorrect because Penelope is an active (not passive) participant and her responses are voluntary (not involuntary).

Option D is correct. Penelope is not sleeping well at night, so she drinks wine to help her fall asleep. Penelope is likely to repeat this behaviour (it becomes a habit), and therefore her behaviour is being reinforced. This could be seen as either positive reinforcement because she achieves a positive consequence (falling asleep) or as negative reinforcement because she avoids a negative consequence (not being able to fall asleep).

**Question 5****Answer: D****Explanatory notes**

Option A is incorrect because alcohol is a depressant and would lead to a decrease in beta waves.

Options B and C are incorrect because theta and delta waves are only present when asleep.

Option D is correct because alcohol is a depressant and would lead to a decrease in beta waves.

**Tip**

- *This question is a good example of why is it important to read the question carefully. The question asks what happens before Penelope falls asleep.*

**Question 6****Answer: A****Explanatory notes**

Option A is correct because the caffeine in coffee is a stimulant and would lead to an increase in beta waves.

Options B and C are incorrect because Penelope is not sleeping.

Option D is incorrect because the caffeine in coffee is a stimulant and would lead to an increase in beta waves.

**Question 7****Answer: B****Explanatory notes**

Options A, C and D are incorrect because when Penelope is alert, she experiences an increase in beta waves, which are lower in amplitude and higher in frequency than other brain waves.

Option B is correct because beta waves are lower in amplitude and higher in frequency than other brain waves.

**Question 8****Answer: C****Explanatory notes**

Option A is incorrect because based on this information we cannot conclusively say that Penelope is suffering from clinical anxiety or depression. We also do not know the timeline for her behaviours. For a mental health disorder to be considered, the behaviours need to be present for a prolonged period. From the information in the question, the break-up with her boyfriend and her mother's cancer diagnosis are recent.

Option B is incorrect because a dependency on stimulants (coffee) and depressants (wine) can be dysfunctional; we therefore cannot say that Penelope is mentally healthy and that she has a high sense of wellbeing.

Option C is correct because Penelope is showing a change in her habits to help her cope with her anxiety and sleeping issues. At the moment, her symptoms are mild.

Option D is incorrect because it does not refer to where Penelope would be sitting on the mental health continuum.

**Question 9****Answer: B****Explanatory notes**

Option A is incorrect because the autonomic nervous system controls the internal organs, glands and visceral muscles of the body (not the skeletal muscles).

Option B is correct because the somatic nervous system controls the motor movements of skeletal muscles, such as those in Ryoji's legs.

Option C is incorrect because, although the spinal cord is essential for someone to be able to move, Ryoji's ability to run is predominantly dependent on the somatic nervous system.

Option D is incorrect because the somatic nervous system is part of the peripheral nervous system (not the central nervous system).

**Question 10**

**Answer: D**

**Explanatory notes**

Option A is incorrect because the corpus callosum (not the spinal cord) is responsible for communication between the hemispheres of the brain.

Options B and C are incorrect because the spinal cord carries information in both directions.

Option D is correct because the spinal cord is bi-directional.

**Question 11**

**Answer: A**

**Explanatory notes**

Option A is correct because slapping at a mosquito on your hand is voluntary and involves a conscious decision by the brain. The brain will have processed the sensation of the mosquito on your skin and then instructed the arm muscles to slap at the mosquito.

Options B, C and D are incorrect because they are all examples of spinal reflexes that involve involuntary responses.

**Question 12**

**Answer: D**

**Explanatory notes**

Option A is incorrect because sensory memory has an unlimited capacity and short-term memory has a capacity of 5–9 items.

Option B is incorrect because sensory memory has a duration of 0.2–4.0 seconds and short-term memory has a duration of 12–30 seconds.

Option C is incorrect because the function of sensory memory differs from the function of short-term memory.

Option D is correct because sensory memory has an unlimited capacity.

**Question 13**

**Answer: C**

**Explanatory notes**

Options A and B are incorrect because they are considered less effective methods of retrieval than relearning.

Option C is correct because relearning is the most effective method of retrieval.

Option D is incorrect because reconstruction can involve misinformation and is not considered as effective as relearning.

**Question 14**

**Answer: B**

**Explanatory notes**

Option A is incorrect because Meg would have an increase in both heart rate and blood pressure when her stress response was activated.

Option B is correct because Meg would have an increase in both heart rate and blood pressure.

Option C is incorrect because Meg would have an increase in cortisol, not a decrease.

Option D is incorrect because Meg would have an increase in cortisol, not a decrease.

**Note:** Students should know that epinephrine is another form of adrenaline.

**Question 15**

**Answer: D**

**Explanatory notes**

Options A and B are incorrect (daily pressures are also known as hassles). Hitting and killing an animal on the road is not a daily occurrence.

Option C is incorrect because, although hitting and killing the cat is stressful, it would not be considered a catastrophe because it does not cause widespread suffering for a large group of people.

Option D is correct because hitting and killing a cat is considered a life event.

**Question 16**

**Answer: A**

**Explanatory notes**

Option A is correct because adrenaline is the only neurohormone listed.

Options B, C and D are incorrect because these are neurotransmitters, not neurohormones.

**Question 17****Answer: B****Explanatory notes**

Option A is incorrect because, although the hippocampus is helpful for storage of the memory, it is more likely to consolidate the facts and details associated with the event.

Option B is correct because the amygdala plays a role in the consolidation of emotional memories.

Option C is incorrect because the cerebellum is more involved in motor memory.

Option D is incorrect because, although the cerebral cortex is thought to help with storage of memories, the question specifically asks for emotional responses and emotional memories, which is a role of the amygdala.

**Question 18****Answer: A****Explanatory notes**

Option A is correct because the hippocampus consolidates explicit details such as the colour of the cat's fur.

Option B is incorrect because the amygdala stores the emotional nature of memories rather than the facts.

Option C is incorrect because the cerebellum is more involved in motor memory.

Option D is incorrect because, although the cerebral cortex is thought to help with storage of memories, the question specifically asks how Meg holds on to information such as fur colour.

**Question 19****Answer: B****Explanatory notes**

Option A is incorrect because sensory memory has a duration of 0.2–4.0 seconds; waiting 12 seconds exceeds this duration.

Option B is correct because 12 seconds is within the short-term memory duration (12–30 seconds).

Option C is incorrect because 12 seconds falls within short-term memory duration (12–30 seconds). While it is possible that long-term memory is being investigated, the question asks which type of memory is *likely*.

Option D is incorrect because declarative memory is a type of long-term memory.



**Question 20****Answer: D****Explanatory notes**

Option A is incorrect because the independent variable is stress (Marcus is investigating the impact of stress on recall) and the operations are learning words in 45 seconds and 15 seconds. The 15 seconds would have added time pressure that causes stress.

Option B is incorrect because it describes the dependent variable, not the independent variable, and the operations are not the number of words correctly recalled.

Option C is incorrect because the study was not measuring relearning and the operations are not the number of words correctly recalled.

Option D is correct because the independent variable is stress and the operations are learning words in 45 seconds and 15 seconds.

**Question 21****Answer: D****Explanatory notes**

Option A is incorrect because the question is asking for the three-phase model for Peggy (option A explains the three-phase model for Christina).

Option B is incorrect because Peggy is not learning through classical conditioning; she is learning through operant conditioning. Students should note that option B does not accurately reflect classical conditioning.

Option C is incorrect because scratching the furniture is Peggy's behaviour, not the antecedent.

Option D is correct because it describes the three-phase model for Peggy.

**Question 22****Answer: A****Explanatory notes**

Option A is correct because being sprayed with the lemon mixture is a punishment that decreases the response rate.

Options B and D are incorrect because being sprayed in the face with the lemon mixture does not increase the likelihood of Peggy repeating the behaviour.

Option C is incorrect because negative reinforcement involves the removal of an unpleasant stimulus to increase or strengthen a response. In this case, Peggy is presented with an unpleasant stimulus (the lemon mixture) as a punishment to weaken or decrease her behaviour of scratching the furniture.

**Question 23****Answer: D****Explanatory notes**

Options A and C are incorrect because there is no evidence of other stimuli being present for stimulus discrimination or stimulus generalisation to occur.

Option B is incorrect because if Peggy still associated the scratching behaviour with the consequence she would not have restarted the behaviour.

Option D is correct because Peggy no longer associates her behaviour with the consequence of being sprayed with the lemon mixture.

**Question 24****Answer: B****Explanatory notes**

Option A is incorrect because the amount of sleep we need decreases as we get older.

Option B is correct because we spend less time in REM sleep as we get older.

Option C is incorrect because we spend less time in REM sleep as we get older.

Option D is incorrect because older people (aged 60 years or older) spend less time in NREM stages 3 and 4.

**Question 25****Answer: B****Explanatory notes**

Option A is incorrect because positive punishment is when an aversive stimulus is applied.

Option B is correct because switching off the television is taking away a positive stimulus (a response cost).

Options C and D are incorrect because the behaviour was undesirable and was not being strengthened.

**Question 26****Answer: B****Explanatory notes**

Option A is incorrect because an increase in neurotransmitters is a functional (activity) change, not a structural change.

Option B is correct because the number of axon terminals on the pre-synaptic neurons increases.

Option C is incorrect because there is an increase, not a decrease, of dendrites when a memory is formed.

Option D is incorrect because, although the number of axon terminals increases when a memory is formed, the axon terminals develop on the pre-synaptic neurons (not the post-synaptic neurons).

**Question 27****Answer: B****Explanatory notes**

Option A is incorrect because there would be an increase in activity at the synapse when a memory is formed.

Option B is correct because there would be an increase in activity at the synapse when a memory is formed.

Option C is incorrect because the growth of axon terminals is a structural change, not a functional change.

Option D is incorrect because a decrease in the number of dendrites is a structural change, not a functional change.

**Question 28****Answer: D****Explanatory notes**

Option A is incorrect because the neurotransmitter involved is glutamate.

Options B and C are incorrect because long-term potentiation (not long-term depression) is the process.

Option D is correct because long-term potentiation is the process and the neurotransmitter is glutamate.

**Question 29****Answer: A****Explanatory notes**

Option A is correct because the hippocampus shrinks due to the loss of neurons.

Options B and C are incorrect because Alzheimer's disease is a neurodegenerative disorder in which there is a death of neurons; brain mass would not increase.

Option D is incorrect because the brain would show shrinkage due to the disease.

**Question 30****Answer: A****Explanatory notes**

Option A is correct because the conditions involve changing environments, which are context-dependent cues.

Option B is incorrect because iconic memory is a form of visual sensory memory, which is not being assessed in this study.

Option C is incorrect because the experiment does not include the participants assigning meaning to the words.

Option D is incorrect because state-dependent cues refer to internal states of the learner, which are not being assessed in this study.

**Question 31****Answer: C****Explanatory notes**

Option A is incorrect because sensory memory has a duration of 0.2–4.0 seconds, whereas Simon makes the participants wait 60 seconds before answering.

Option B is incorrect because short-term memory has a duration of 12–30 seconds, whereas Simon makes the participants wait 60 seconds before answering.

Option C is correct because Simon is making the participants wait 60 seconds before answering. This duration is consistent with long-term memory.

Option D is incorrect because iconic memory is a type of sensory memory.

**Question 32****Answer: A****Explanatory notes**

Option A is correct because the average number of words for Condition 2 (12.6) was lower than the average number for Condition 1 (23.5).

Option B is incorrect because the average number of words for Condition 2 (12.6) was lower than the average number for Condition 1 (23.5).

Option C is incorrect because the average number of words for Condition 4 (10.2) was lower than the average number for Condition 3 (19.8).

Option D is incorrect because the average number of words for Condition 4 (10.2) was lower than the average number for Condition 2 (12.6).

**Tip**

- *This question is difficult because it requires students to read the table and check to see what each condition involves. A good strategy is for students to make notes about which column in the table relates to which condition.*

**Question 33****Answer: C****Explanatory notes**

Options A and B are incorrect because motor neurons (efferent neurons) are responsible for actions and carry information away from the brain rather than towards it.

Option C is correct because afferent neurons carry sensory information (about touch and size) to the brain.

Option D is incorrect because interneurons transfer information between sensory and motor neurons.

**Question 34****Answer: B****Explanatory notes**

Options A and C are incorrect because sensory neurons (afferent neurons) are not responsible for voluntary movement.

Option B is correct because efferent (motor) neurons are responsible for voluntary movement.

Option D is incorrect because interneurons transfer information between sensory and motor neurons.

**Question 35**

**Answer: A**

**Explanatory notes**

Option A is correct because it accurately describes the transfer and processing of sensory information for Task 1.

Option B is incorrect because this describes Task 2, not Task 1.

Option C is incorrect because the peripheral nervous system does not process sensory information, only carries it.

Option D is incorrect because the peripheral nervous system does not initiate a motor response and this relates to Task 2, not Task 1.

**Question 36**

**Answer: D**

**Explanatory notes**

Options A and B are incorrect because they describe Task 1, not Task 2.

Option C is incorrect because the peripheral nervous system does not initiate a motor response.

Option D is correct because it accurately describes the initiation and transfer of the voluntary motor response for Task 2.

**Question 37**

**Answer: D**

**Explanatory notes**

Options A, B and C are incorrect because it is not accurate to say that one domain is more important than another in influencing mental health.

Option D is correct because all domains influence mental health.

**Question 38****Answer: C****Explanatory notes**

As a person moves from normal waking consciousness (with high levels of alertness and beta waves) to an altered state of consciousness, they will experience more alpha waves (which are higher in amplitude and lower in frequency than beta waves).

Option A is incorrect because brain waves would change in both frequency and amplitude.

Option B is incorrect because an increase in amplitude results in a decrease in frequency, not an increase.

Option C is correct because alpha waves have decreased frequency and increased amplitude.

Option D is incorrect because with a decrease in frequency there should be an increase in amplitude, not a decrease.

**Question 39****Answer: D****Explanatory notes**

Options A and C are incorrect because theta and delta waves occur in sleep, which is an altered state of consciousness but is not the focus of this question.

Option B is incorrect because beta waves are present when someone is in normal waking consciousness and alert.

Option D is correct because an altered state of consciousness increases the amplitude and decreases the frequency of brain waves; this is consistent with alpha waves.

**Question 40****Answer: D****Explanatory notes**

Option A is incorrect because the information provided states that the Plains Indians use non-drug methods.

Option B is incorrect because a change in awareness does not cause visions.

Option C is incorrect because a change in time perception does not cause visions.

Option D is correct because distorted sensory perception can cause visions.

**Question 41****Answer: B****Explanatory notes**

Option A is incorrect because muscle tension increases the experience of pain; it does not decrease it.

Option B is correct because muscle relaxation decreases the experience of pain.

Option C is incorrect because a euphoric state decreases the experience of pain; it does not increase it.

Option D is incorrect because focused attention increases the experience of pain; it does not decrease it.

**Question 42****Answer: D****Explanatory notes**

Option A is incorrect because this relates to a breach of confidentiality rather than the role of the experimenter.

Option B is incorrect because this relates to the use of deception and issues of informed consent rather than the role of experimenter.

Option C is incorrect because extinction should have occurred during debriefing. This is a violation of the debriefing principle rather than the role of the experimenter.

Option D is correct because the welfare of research participants should be prioritised.

**Question 43****Answer: A****Explanatory notes**

Option A is correct because an ultradian rhythm has a period of less than 24 hours.

Option B is incorrect because a circadian rhythm has a period of 24 hours.

Option C is incorrect because an infradian rhythm has a period of more than 24 hours.

Option D is incorrect because diurnal rhythms are restricted to daylight hours.



**Question 44****Answer: D****Explanatory notes**

Option A is incorrect because REM does not occur directly after stage 4 NREM.

Option B is incorrect because the person would enter stage 1 NREM first, not REM.

Option C is incorrect because the person has not entered stage 4 NREM, which is a feature of the first cycle of sleep in a night.

Option D is correct because the person enters and leaves stage 4 NREM before entering REM.

**Question 45****Answer: B****Explanatory notes**

Option A is incorrect because the evolutionary theory, not the restorative theory, proposes that sleep protects organisms from predators.

Option B is correct because the restorative theory proposes that sleep enables damaged cells to be repaired and the evolutionary theory proposes that sleep allows organisms to conserve energy.

Option C is incorrect because the evolutionary theory, not the restorative theory, proposes that sleep allows organisms to conserve energy.

Option D is incorrect because the restorative theory, not the evolutionary theory, proposes that sleep enables damaged cells to be repaired.

**Question 46****Answer: A****Explanatory notes**

Option A is correct because sleepwalking is a parasomnia that occurs during stage 3 or stage 4 NREM sleep.

Option B is incorrect because sleepwalking is a parasomnia, not a dyssomnia, and does not occur during REM sleep.

Option C is incorrect because, although sleepwalking is a parasomnia, it occurs during stages 3 and 4 NREM sleep, not stage 2 NREM sleep.

Option D is incorrect because, although sleepwalking does occur in stage 4 NREM sleep, sleepwalking is a parasomnia, not a dyssomnia.

**Question 47**

**Answer: A**

**Explanatory notes**

Option A is correct because involuntary muscle tremors are motor symptoms of Parkinson's disease.

Option B is incorrect because brain seizures are not common motor symptoms of Parkinson's disease.

Options C and D are incorrect because these are non-motor symptoms of Parkinson's disease.

**Question 48**

**Answer: B**

**Explanatory notes**

Options A and C are incorrect because dopamine levels would decrease.

Option B is correct because dopamine levels would decrease.

Option D is incorrect because some dopamine would still be present in the synapses.

**Question 49****Answer: B****Explanatory notes**

Option A is incorrect because his mother's and sister's experiences with depression is a social (or possibly genetic) predisposing factor. A predisposing factor is anything that might make a person vulnerable to developing a mental illness.

Option B is correct because drinking alcohol can trigger the onset of a mental illness.

Option C is incorrect because a genetic predisposition is a biological predisposing factor.

Option D is incorrect because losing his job is a social perpetuating factor. A perpetuating factor maintains the presence of a mental illness.

**Tip**

- *Students must know the difference between predisposing, precipitating and perpetuating factors. Precipitating factors are events that occur near the onset of a mental health issue and are likely to have triggered or contributed to its development. In this case, Festim drank a large amount of alcohol regularly before he experienced his first depressive episode.*

**Question 50****Answer: D****Explanatory notes**

Option A is incorrect because his mother's and sister's experiences with depression is a social (or possibly genetic) predisposing factor.

Option B is incorrect because this is a biological precipitating factor. There is evidence that drug use, such as drinking alcohol, can cause the onset of mental health disorders.

Option C is incorrect because a genetic predisposition is a biological predisposing factor.

Option D is correct because losing his job is a social perpetuating factor.

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## SECTION B

### Question 1

#### Sample response

If Tom and Jude recalled the memories of their first date several times it is possible that extra details were added each time (e.g. from their friends and family).

Any missing aspects in their memory might then be filled by their personal beliefs or values to make the memory seem more plausible.

This misinformation is then added to their existing memory of the event, causing Tom's and Jude's reconstructed memories of their first date to be different, suggesting that one, or both, of them has an inaccurate recall.

#### *Mark allocation: 3 marks*

- 1 mark for stating that they may have recalled the memories of their first date several times, which may have resulted in extra details being added (e.g. from friends and family)
- 1 mark for stating that misinformation may have been added to their existing memory, causing Tom's and/or Jude's recalled memory of their first date to be inaccurate
- 1 mark for referring to Jude and/or Tom drawing on their personal values, beliefs and expectations to make up or add missing bits to complete their memory in a logical or plausible way

#### **OR**

- 1 mark for referring to Jude and/or Tom filling in the gaps, leading them to reconstruct a less accurate memory of their first date

### Question 2

#### Sample response

Consciousness is a psychological construct because it is not directly observable – we cannot see it. We can measure consciousness through other objective measures such as measuring brain waves.

#### *Mark allocation: 2 marks*

- 1 mark for stating that consciousness is not directly observable
- 1 mark for referring to using indirect subjective or objective measures to assess consciousness (e.g. measuring brain waves using an EEG, measuring muscle activity using an EMG, or measuring activity in the muscles surrounding the eyes using an EOG or video monitoring)

### Question 3

#### Sample response

The placebo effect could influence the results because if the participants know which groups they are in, their behaviour may change as a result of their expectations rather than the effects of the independent variable.

#### *Mark allocation: 2 marks*

- 1 mark for naming participant expectations, the placebo effect or the Hawthorne effect
- 1 mark for stating that participant expectations (or the placebo/Hawthorne effect) will influence participants' behaviour, meaning that the independent variable will not be the only variable influencing the dependent variable

### Question 4

#### Sample response for 'no'

No. Driving when you are sleep deprived is just as risky as driving when you are drunk.

A person who hasn't slept for 17 hours (partial sleep deprivation) is thought to respond in a similar way to a person with a blood alcohol content (BAC) of 0.05 and is therefore twice as likely to have a crash as a person with a BAC of 0.0.

A person who has had 24-hour sleep deprivation (total sleep deprivation) is thought to respond in a similar way to a person with a BAC of 0.1. A person who is sleep deprived is seven times more likely to have a crash than a person with a BAC of 0.0.

It can then be concluded that sleep-deprived driving can be just as risky as drink driving.

#### Sample response for 'yes'

Yes. A person who drinks and drives is at a greater risk than a person who is sleep deprived when they drive.

A person who hasn't slept for 17 hours (partial sleep deprivation) is thought to respond in a similar way to a person who has a blood alcohol content (BAC) of 0.05. These people are twice as likely to have a crash as a person with a BAC of 0.0. Likewise, a person who has had 24-hour sleep deprivation (total sleep deprivation) is thought to respond in a similar way to a person with a BAC of 0.1. These people are seven times more likely to have a crash than a person with a BAC of 0.0.

However, a BAC of 0.1 tends to be approximately four drinks for women and five drinks for men over two hours. Thus it is very possible that people will consume more than this and have a BAC greater than 0.1.

It can therefore be concluded that driving while drunk is riskier than driving when sleep deprived.

**Mark allocation: 4 marks**

This response should be marked holistically.

- 4 marks: The response compares blood alcohol content (BAC) to partial and total sleep deprivation and uses examples to support the response (see examples above). For full marks, the response should support their judgement of 'yes' or 'no' to the question.
- 2–3 marks: The response attempts to compare the effects of BAC to sleep deprivation, but does not fully explore partial and total sleep deprivation. The response vaguely supports the student's judgement of 'yes' or 'no' to the question.
- 1 mark: The response makes an attempt to answer the question by using relevant examples or attempting a comparison. It may not support the student's 'yes' or 'no' judgement to the question.

**Note:** Another way to approach a 'no' response is to explain that a BAC of 0.05 and extended sleep deprivation both result in similar impairments to cognitive functioning. It is possible that a student could gain full marks for this response by the examples they use. For example, extended sleep deprivation and a BAC of 0.05 both result in reduced attention, impaired judgement, reduced hand-eye coordination, lack of clear (logical) thinking, reduced alertness, reduced ability to divide attention between tasks (so may struggle to hold a conversation while driving) etc.

**Tip**

- *This question is an example of a holistic question where a student could argue either 'yes' or 'no'. The key to obtaining full marks is the justification for that response.*

## Question 5

### Sample response

Dr Wilson could use a logic puzzle as a *cognitive measure*. Kotaro's speed and accuracy could be measured at the beginning of the study (when he is assumed to be alert) as well as when he is drowsy. As logic puzzles are more complex, Kotaro's speed and accuracy on the cognitive tasks should show no significant difference between when he is drowsy and when he is alert. (Whereas had Dr Wilson used a simple dot-to-dot task, Kotaro's performance would have been affected negatively, because simple tasks are more difficult when drowsy.)

Dr Wilson could use a *physiological measure* such as an EEG to determine if Kotaro is alert or drowsy. When Kotaro is alert and in normal waking consciousness, we expect to see beta waves (i.e. high frequency and low amplitude waves) on the EEG. When Kotaro is drowsy and in an altered state of consciousness, we expect to see alpha waves on the EEG (i.e. a reduction in frequency and an increase in amplitude).

From an ethical perspective, it is very important that Kotaro is fully informed about the nature and purpose of the study, and that he gives his signed consent. He should also understand that he can withdraw at any time during the study (before, during or after) and that his results will be kept anonymous. In light of the fact that the study is based on his performance, debriefing would be very important. In debriefing, Kotaro would receive his results and have them explained to him. Counselling should also be offered if there are any issues raised.

### Mark allocation: 8 marks

*This response should be marked holistically using the points below as a guide. Please note that students must discuss speed and accuracy for full marks.*

#### Cognitive measures

- 1 mark for a *cognitive measure*. This could be a series of logic puzzles (for a complex task) or a dot-to-dot activity (as a simple task), or could be something such as a driving simulation task where speed and accuracy are measured. Any task that shows how cognitive processes are measured is acceptable here.
- 1 mark for explaining that Kotaro's speed and accuracy should be measured when he is in both states of consciousness.
- 1 mark for explaining the expected impact of Kotaro's alertness/drowsiness on his speed and accuracy.

#### Physiological measures

- 1 mark for a *physiological measure*. This could be an EEG, EOG or EMG.
  - 1 mark for identifying what the measure would show when Kotaro is alert. For example, when Kotaro is alert and in normal waking consciousness we expect to see beta waves (or high frequency and low amplitude waves) on the EEG, high levels of electrical activity on the EOG and medium to high levels of electrical activity on the EMG (or at least a higher level on the EMG compared with when he is relaxed).
- Note:** the response must match the physiological measure chosen.
- 1 mark for identifying what the measure would show when Kotaro is drowsy. For example, when Kotaro is drowsy and in an altered state of consciousness, we expect to see alpha waves on the EEG (i.e. a decrease in frequency and an increase in amplitude), and reduced levels of electrical activity on both the EOG and EMG.



## Ethical principles

Any two of the principles below are acceptable for full marks.

- 1 mark for the role of the experimenter. Dr Wilson should minimise harm to Kotaro and ensure ethical principles are adhered to.
- 1 mark for voluntary participation. Dr Wilson should ensure that Kotaro is a willing participant and is not forced to be involved in the study.
- 1 mark for informed consent. Dr Wilson should explain to Kotaro the nature and purpose of the study and the participant's rights, and ensure that Kotaro signs a permission form (or that it is signed by his parent or guardian).
- 1 mark for withdrawal rights. Kotaro has the right to remove himself from the experiment at any time (before, during or after).
- 1 mark for confidentiality. Kotaro's results should remain private and anonymous if the research is published.
- 1 mark for debriefing. Following the study, Kotaro's results should be shared with and explained to him and information about counselling services offered.



### Tips

- *There are two components to this question: cognitive and physiological. Students should ensure therefore that both aspects of the question are addressed.*
- *Understanding ethical principles (including the role of the experimenter) is a key scientific skill. You should familiarise yourself with these principles and include them in any response asking for a research method to be devised.*

**Question 6a.****Sample response**

According to Selye's theory, Mario is likely to be in the resistance stage because he is dealing with multiple stressors, including his work, his mum and looking after his kids on his own. Although Mario is resisting, the likelihood of him catching an illness increases as a result of the prolonged release of cortisol in his system. This results in an impaired immune system so it is not surprising that he has a bad cold and cough.

**Mark allocation: 3 marks**

- 1 mark for stating the stage of General Adaptation Syndrome (GAS) as resistance
- 1 mark for stating that Mario's immune system is inhibited, and this increases the likelihood of him getting sick
- 1 mark for naming cortisol

**Tip**

- *A question such as this would expect students to identify the stage of GAS Mario is in. Note that Mario is not yet in the exhaustion stage because he is still coping and resisting the various stressors.*

**Question 6b.****Sample response**

Two emotional effects could be anxiety and mood swings, and two cognitive effects could be difficulty concentrating and difficulty making decisions.

**Mark allocation: 4 marks**

- 1 mark each for any two of the following emotional effects (up to 2 marks):
  - irritability or mood swings
  - anxiety
  - lack of motivation
  - depression
- 1 mark each for any two of the following cognitive effects (up to 2 marks):
  - difficulty concentrating / difficulty making decisions
  - disordered thinking
  - illogical thinking
  - difficulty problem solving
  - difficulty recalling some information

**Question 6c.****Sample response**

Mario has assessed the work project as a challenge (an experience that involves the potential for individual gain or growth).

Mario's mum has assessed the work project as a threat to Mario, or as a harm to him, because he is now sick.

**Mark allocation: 2 marks**

- 1 mark for Mario assessing the work project as a challenge
- 1 mark for Mario's mother assessing the work project as a threat and/or a harm

**Tip**

- *In this case, it would not be acceptable to say that Mario assesses the new project as irrelevant or neutral. This is not the case because Mario wants to work on the project for a promotion.*

**Question 7a.**

- i.** unconditioned stimulus: pain from the injection
- ii.** neutral stimulus: nurse or the sight of a nurse
- iii.** conditioned stimulus: nurse or the sight of a nurse
- iv.** unconditioned response: fear of pain from injection **OR** scream because of pain from injection
- v.** conditioned response: fear of nurse **OR** scream at sight of nurse

***Mark allocation: 5 marks***

- 1 mark for each answer above (up to 5 marks)

**Question 7b.****Sample response**

Glutamate OR gamma amino butyric acid (GABA)

***Mark allocation: 1 mark***

- 1 mark for glutamate or GABA, but could also accept serotonin, dopamine or epinephrine

**Question 7c.****Sample response**

The antecedent for Indy is nurses. Avoidance of nurses makes Indy feel better but this behaviour perpetuates the phobia. Perpetuation occurs through operant conditioning. Indy has been negatively reinforced by her avoidance behaviours. When she avoids nurses she does not experience fear and she avoids the unpleasant consequence. The likelihood of her repeating these behaviours increases.

Unfortunately, avoidance also prevents Indy from learning that the phobia may not be as frightening or overwhelming as she thinks. Avoidance of nurses may also interfere with Indy's overall physical and mental wellbeing if she does not seek help from a nurse when she is unwell.

**Mark allocation: 7 marks**

*This may be marked holistically. However, a suggested marking guide is also provided below.*

- 1 mark for stating that perpetuation occurs through operant conditioning.
- 1 mark for stating that the antecedent is nurses (or possibly hospitals or medical clinics).
- 1 mark for stating that, while the avoidance of nurses makes Indy feel better, this perpetuates the phobia. Indy's avoidant behaviour is the B in the three-phase model of operant conditioning. Avoiding clinics or hospitals or only seeing doctors are examples of avoidance behaviours.
- 1 mark for discussing Indy's negative reinforcement. When she avoids nurses, she does not experience fear, and therefore she avoids the unpleasant consequence (the third phase of the three-phase model).
- 1 mark for discussing the likelihood of Indy repeating the behaviour. For example, Indy is negatively reinforced, which means that the likelihood of her repeating her avoidance behaviours increases.
- 1 mark for stating that avoidance may not be good because it prevents her from learning that the phobia may not be as frightening or overwhelming as she thinks.
- 1 mark for stating that avoidance of nurses may also interfere with Indy's overall physical and mental wellbeing (e.g. not seeking help from a nurse when she is unwell in the future).

**Question 7d.****Sample response**

A biological intervention could be breathing retraining or exercise. Breathing retraining reduces heart and breathing rates (which are often elevated by the fight-flight-freeze response) and helps relax muscles. Exercise uses up stress hormones (which can be helpful) and helps regulate breathing, promote cardiovascular health and relax muscles after exercise.

A psychological evidence-based intervention is cognitive behavioural therapy (CBT). A major assumption underlying CBT is that the way people *feel* and *behave* is largely a product of what they *think*. Therefore, CBT combines cognitive therapy and behavioural therapy, in this case to change the thoughts and avoidance behaviours of Indy with nurses. The key would be to help Indy identify any unhelpful thoughts she has about nurses, and then identify more helpful balanced thoughts. As a behavioural component of CBT, Indy could identify her avoidance behaviours and try to overcome these slowly by decreasing this behaviour or even showing more approach behaviours.

**Mark allocation: 4 marks**

Any two of the following (name and explanation) are acceptable for full marks.

- 1 mark for biological: benzodiazepines
- 1 mark for an explanation: such as, Indy has anxiety, which is associated with low levels of GABA. Benzodiazepines are medications that attempt to increase the level of GABA in the system. This should help lower Indy's anxiety or stress response.

**OR**

- 1 mark for biological: breathing retraining or exercise
- 1 mark for an explanation: such as, breathing retraining involves teaching Indy to maintain correct breathing patterns, or alter abnormal breathing patterns when anxious. This will help to reduce heart rate and relax muscles, which are often elevated by the fight-flight-freeze response.

**OR**

- 1 mark for psychological: cognitive behavioural therapy (CBT)
- 1 mark for explaining the cognitive component of CBT: helping Indy identify any unhelpful thoughts she has about nurses, then identify more helpful balanced thoughts. As a behavioural component of CBT, Indy could identify her avoidance behaviours and try to overcome these slowly by decreasing this behaviour or even showing more approach behaviours.

**OR**

- 1 mark for psychological: systematic desensitisation
- 1 mark for an explanation: such as, Indy would first be taught relaxation techniques. Then she would create a fear hierarchy with her therapist of most frightening situation (e.g. speaking to or touching a nurse) to least frightening (e.g. a picture of a nurse). Indy would then be progressively exposed to each stimulus on the hierarchy (starting with the least scary event) while pairing it with a relaxation technique. When relaxation is achieved, Indy would progress to the next level of the hierarchy and continue until she reaches the most frightening experience.

**OR**

- 1 mark for social: psychoeducation of family members and supporters of Indy
- 1 mark for an explanation: such as, Indy's family and friends may be encouraging or reinforcing her avoidance behaviours out of concern for Indy (especially because it may be distressing for them to observe her fear response to nurses). This is counterproductive because they may be contributing to her phobia unintentionally. Therefore, it would be important to educate Indy's family and friends and explain that they should not be reinforcing Indy's avoidance behaviours. If family members or supporters also share Indy's fear of injections, then they should also seek support for their fear. This would prevent Indy from modelling their behaviour through observational learning.

### **Question 8a.**

#### **Sample response**

It is hypothesised that children who have delayed recall of the 20 images (are made to wait ten minutes) will have reduced memory recall (or lower test scores) than children who have immediate recall of the 20 images.

#### ***Mark allocation: 2 marks***

- 2 marks for an appropriate research hypothesis

### **Question 8b.**

#### **Sample response**

Independent variable: immediate recall versus delayed recall (playing a game for ten minutes before recall)

Dependent variable: recall score out of a total of 20 images

#### ***Mark allocation: 2 marks***

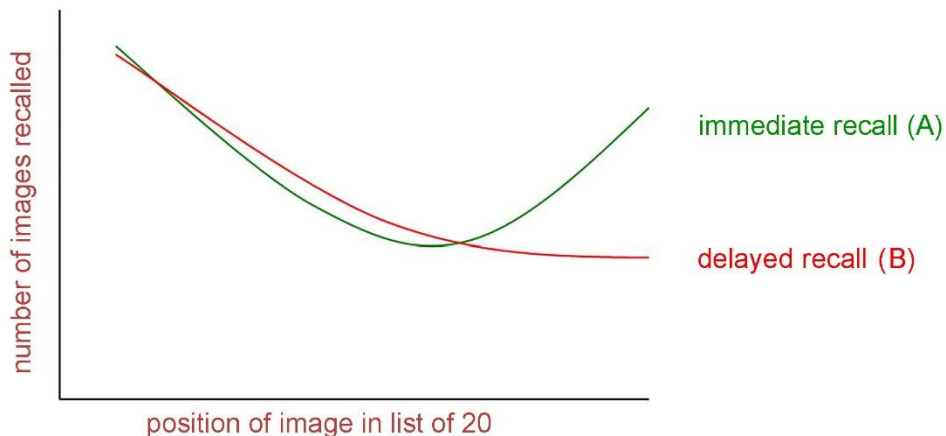
- 1 mark for correct identification of the independent variable as immediate recall versus delayed recall (delay of ten minutes)
- 1 mark for the correct identification of the dependent variable as the recall score out of a total of 20 images

**Question 8c.****Sample response**

It is likely that Group A would recall more images than Group B. Group A would also be likely show a primacy effect (superior recall of the first few images) and a recency effect (superior recall of the last few images). In contrast, Group B would not show a recency effect because their recall was delayed by ten minutes, which means the images would no longer be held in short-term memory.

**Mark allocation: 5 marks**

- 1 mark for stating that Group A would recall more images than Group B
- 1 mark for stating that Group A would be likely to show both a primacy effect and a recency effect
- 1 mark for stating that the primacy effect involves superior recall for the images at the start of the list
- 1 mark for stating that the recency effect involves superior recall for the images at the end of the list
- 1 mark for stating that Group B would not show a recency effect because the recall was delayed by ten minutes, which exceeds the duration of short-term memory

**Question 8d.****Sample response****Mark allocation: 3 marks**

- 1 mark for labelling the x and y axes of the graph
- 1 mark for estimating Group A's curve (i.e. showing primacy and recency effect)
- 1 mark for estimating Group B's curve (i.e. showing primacy effect only)



**Question 8e.****Sample response**

All participants will undertake both conditions (exercising and not exercising) before completing a recall test.

**Mark allocation: 1 mark**

- 1 mark for stating that all participants will undertake both conditions before completing a recall test
- OR**
- 1 mark for stating that all participants will be in both the control (not exercising) and experimental (exercising) conditions (groups)

**Question 8f.****Sample response**

Intelligence is an extraneous variable that could affect the results. In a repeated measures design, intelligence should not affect the results because each participant is tested under both conditions.

**Mark allocation: 2 marks**

- 1 mark for explaining participant effects and that this factor should not cause a difference in the results because all participants are tested under both conditions
- 1 mark for identifying a possible participant characteristic relevant to the study, such as memory ability, level of fitness, body mass or any stimulants they consume during the day that may affect their performance on the test

## Question 9

### Sample response

A key learning theory that is targeted in this pamphlet is observational learning. In this case, the parent is the role model and the child is the learner. This is an example of social learning because the child will mimic their parents' behaviours; that is, what they see is what they will do. The pamphlet explains to parents that they are role models who should eat healthy food in front of their children (this is tip number 1 on the pamphlet).

There are five stages in observational learning: attention, retention, reproduction, motivation and reinforcement.

In terms of the first stage, children need to be paying attention (actively watching) the parent. The pamphlet suggests parents do this by turning off the TV and putting phones away during dinner time (tip number 3). This will allow children to concentrate on eating and watching their parents. Sitting together also gives children clear opportunity to observe without distraction (tip number 2).

In the second stage, children must retain what they have seen, that is, they need to remember the healthy eating behaviours. This is not as clearly shown on the pamphlet but the fewer distractions (such as TV) the better their retention.

In the third stage, reproduction, children need to be able to physically reproduce the behaviours they observed. Children must have access to the same food and utensils that their parents are using. Tip number 4 talks about involving children in the process, and involving their favourite food increases their reproduction.

The fourth stage is motivation. Children want to be like their parents and they look up to them. This is mentioned in tip number 1. Including children in meal planning will help them look forward to dinner time and be a part of the process, which can be motivating for them (tip number 4).

The final stage is reinforcement. This is the use of praise as positive reinforcement for showing the correct behaviour (e.g. praising the children for eating healthy food). As a result, the children will be more likely to eat healthy food again.

### **Mark allocation: 10 marks**

*This question should be marked holistically. This means that the final mark is a judgement made by the assessor based on the quality and comprehensive nature of a student's response.*

*Students may focus on observational learning **or** operant conditioning in their response. However, students referring only to operant conditioning will not be able to attain full marks, as there is less information in the pamphlet in relation to operant conditioning.*

If the student focuses on observational learning:

- For 8–10 marks, students should identify each of the five stages of observational learning and explain how this is an example of social learning (i.e. the parents are the models and the children are the learners who mimic what they see).  
Students should also explain each of the five stages and provide examples that were provided in the pamphlet for each stage. An 8- or 9-mark answer would miss one or two details. This is up to the judgement of the assessor.
- For 6–7 marks, students may miss explaining one or two of the stages or may miss explaining how observational learning is an example of social learning. There must be gaps in the student's response that distinguishes it from a better response. For example, they may not have considered the entire theory or missed key processes.
- For 5 marks, the response would have larger gaps (e.g. two stages missing) than a 7-mark response and so on. This is up to the judgement of the assessor.

- For 3–4 marks, students explain only part of the observational learning theory and struggle to name and explain the five stages. They will also have fewer examples.
- For 1–2 marks, students recognise that the pamphlet is targeting observational learning but provide only minimal depth or detail in their response.

If the student focuses on operant conditioning:

- As there is less information available in the pamphlet in relation to operant conditioning, students may also provide their own examples – as long as these are relevant to increasing healthy eating behaviour in children.
- Students who discuss operant conditioning may also talk about observational learning. In this case the assessor should refer to the comments above in relation to observational learning.
- For 8–9 marks, students should identify the three-phase model of operant conditioning (antecedent, behaviour and consequence) and discuss the use of reinforcement as a method to increase desirable behaviour (healthy eating).  
Students should refer to examples from the pamphlet to explain the stages and use of reinforcement.
- For 6–7 marks, students may miss explaining one of the three phases or may miss explaining how reinforcement works. There will be gaps in the student’s answer that distinguishes it from a better response. For example, they may not have considered the entire theory or are missing key processes.
- For 5 marks, students’ responses would have larger gaps than a 7-mark response and so on. This is up to the judgement of the assessor.
- For 3–4 marks, students explain only part of operant conditioning. They will also have fewer examples.
- For 1–2 marks, students show some understanding of operant conditioning but provide minimal depth or detail in their response.



### Tips

- *In reference to the second stage of observational learning, you could also discuss tip number 1 in terms of parents talking to their children about why they love eating healthy food. As meaning is being added to the action of eating the food, children are more likely to remember this due to elaborative rehearsal.*
- *In reference to the fourth stage of observational learning, you could also discuss children’s motivation behind understanding the reinforcement – in this case, being told they could watch TV.*

## END OF SAMPLE RESPONSES