

PSYCHOLOGY

Unit 3 & 4 – Written examination



2019 Trial Examination

SOLUTIONS

SECTION A: Multiple-choice questions (1 mark each)

Question 1

Answer: C

Explanation:

Neurotransmitters are released by axon terminals and travel through the synaptic gap to receptor sites on the post synaptic neuron, whereas neurohormones are released by axon terminals and travel into the capillaries and through the bloodstream in order to reach their target cell/s.

Question 2

Answer: A

Explanation:

Seeing the car approaching is a voluntary function of the somatic system. Dilated pupils and surges of adrenaline are functions of the sympathetic division of the autonomic nervous system.

Question 3

Answer: D

Explanation:

Studies have shown that cognitive impacts on an individual who has experienced 24 hours of sustained wakefulness are equivalent to someone with a BAC of 0.01. This would mean that Tom is likely to perform similarly to David on problem solving tasks.

Question 4

Answer: C

Explanation:

Shaking hands and sweating are functions of the sympathetic nervous system, whilst noticing the spelling mistake and re-writing the speech are voluntary and controlled by the somatic nervous system. Although option B appears correct, the autonomic nervous system comprises the sympathetic and parasympathetic nervous systems, and shaking hands is not regulated by both; a more specific response was required.

Question 5

Answer: D

Explanation:

Long term depression involves the long lasting weakening of neural connections. This is often thought to occur as a way of reversing skills or learning, and this is what needs to occur in order for the tennis player to reverse the incorrect tennis skills.

Question 6

Answer: D

Explanation:

Long term potentiation refers to the long lasting strengthening of synaptic connections. This is what needs to occur in order for the tennis player to develop new tennis skills.

Question 7

Answer: B

Explanation:

Procedural memories relating to skills such as playing tennis are formed in the cerebellum, because of its role in hand eye coordination and gross motor control. These skill memories are then stored in the cerebral cortex.

Question 8

Answer: C

Explanation:

An adult spends approximately 80% time asleep in NREM and 20% in REM. An infant spends approximately 50% time asleep in NREM and REM.

Question 9

Answer: B

Explanation:

Memory loss of events that occur following head trauma is known as anterograde amnesia.

Question 10

Answer: D

Explanation:

Rumination is the tendency to continually revisit problems without attempting to solve them. It is related to the mental state of an individual and therefore a psychological factor

Question 11

Answer: A

Explanation:

Agonists act to mimic the actions of a neurotransmitter by binding to the receptor site and stimulating an action. In the case of benzodiazepines, they bind to receptor sites and mimic the action of GABA, which increases the inhibitory effect that GABA has on the nervous system.

Question 12

Answer: B

Explanation:

The use of placebo would involve intentionally depriving participants of a treatment that may improve mental health outcomes. Because of this, the researcher needs to weigh up the concerns about withholding such treatment to maintain research integrity for the greater good of the wider population.

Question 13

Answer: B

Explanation:

Being robbed is the unconditioned stimulus, which produces the unconditioned response of fear.

Question 14

Answer: C

Explanation:

The presence of adrenaline in Simone's bloodstream at the time of the robbery has strengthened the memory, making it more vivid for her, therefore making it easier to recall.

Question 15

Answer: B

Explanation:

By Simone exposing herself to the dark shadows (CS) in the absence of robbers (UCS) she will learn that they are not associated with each other and will eventually extinguish her fear of dark shadows

Question 16

Answer: C

Explanation:

Classical conditioning is a form of learning that is passive, and therefore involuntary.

Question 17

Answer: B

Explanation:

Irritability is an affective effect of partial sleep deprivation. Memory concerns and difficulty concentrating are cognitive.

Question 18

Answer: B

Explanation:

The primacy and recency effect account for superior recall of items at the beginning and end of words in a word list.

Question 19

Answer: A

Explanation:

If recall is delayed for 30 seconds then the recency effect will be lost because the words most recent in STM will be lost due to decay.

Question 20

Answer: C

Explanation:

Forming and maintaining relationships and regulating emotions shows high levels of social and emotional functioning.

Question 21

Answer: C

Explanation:

The neighbour's dog was the antecedent (stimulus in the environment) that triggered the behaviour (Trixie running to the gate and barking).

Question 22

Answer: A

Explanation:

The consequence was Jamie pulling Trixie back after she pulled on the lead and reprimanding her.

Question 23

Answer: A

Explanation:

Trixie's decision is voluntary because of the form of learning associated with this (operant conditioning).

Question 24

Answer: D

Explanation:

Justin most likely has the dyssomnia known as sleep onset insomnia and has utilised a behavioural strategy to assist on overcoming it

Question 25

Answer: B

Explanation:

The first stage of the GAS is alarm. During this stage, the initial response by the body is to act as though it is injured, known as shock. This is the body's first encounter with the stressor and is temporary until counter-shock is initiated. During the stage of counter-shock, the fight-flight response is activated and the bodies resistance to stress rises above normal in an effort to combat the stressor.

Question 26

Answer: C

Explanation:

Most of the time spent asleep at the beginning of the night, in the first few hours is in NREM, with little spent in REM. This changes as the night progresses.

Question 27

Answer: D

Explanation:

An independent groups design was used as the 50 participants were randomly allocated to one condition, and participated in that condition only. Given the study took place at one time point of data collection and there was manipulation of an IV, it was not correlational or longitudinal.

Question 28

Answer: C

Explanation:

Relearning and recognition were used in condition 1 and condition 2 respectively.

Question 29

Answer: B

Explanation:

Given than relearning, used in condition 1, is a more sensitive measure of retention than recognition, used in condition 2, it is expected that there would be a higher rate of recall.

Question 30

Answer: A

Explanation:

The DV was the number of words that were recalled

Question 31

Answer: C

Explanation:

The mean (average) would be the most appropriate measure that would represent the data (the number of words that were recalled between condition 1 and condition 2)

Question 32

Answer: B

Explanation:

An avoidance coping strategy is one that manages the emotions associated with stress. Venting to family and friends is an example.

Question 33

Answer: D

Explanation:

It is likely that Trey will have higher levels of Alpha waves. Although Delta waves may be considered by students, these are associated with slow-wave sleep, and not the consumption of sedative medications.

Question 34

Answer: D

Explanation:

Theresa is in the contemplation stage when considering change to her smoking behaviour.

Question 35

Answer: D

Explanation:

When Theresa begins smoking again, she has relapsed.

Question 36

Answer: D

Explanation:

The axon carries an electrical signal away from the cell body/soma toward the axon terminal within the neuron.

Question 37

Answer: B

Explanation:

The diagram best represents a spinal reflex, which is an unconscious response that does not involve the brain.

Question 38

Answer: A

Explanation:

Jackson nervousness and fear is the result of distress. Katherine is experiencing eustress.

Question 39

Answer: C

Explanation:

An altered state of consciousness as a result of consumption of alcohol (depressant) would result in an altered time orientation and increase in alpha and theta brain waves.

Question 40

Answer: A

Explanation:

His wife and children are protective factors because of the support they provide him.

Question 41

Answer: D

Explanation:

Gabriel's condition is most likely a mental health problem.

Question 42

Answer: C

Explanation:

Cumulative risk refers to the combined contribution of many risk factors in the onset of mental illness. The stress of his job and looking after his sick mother have contributed to this risk.

Question 43

Answer: D

Explanation:

For Sophia, cross-stitching is a controlled process, as it requires high levels of attention and mental effort to complete. However it is an automatic process for her aunty because she has been doing it for so long and does not need to pay as much attention and expend as much mental effort to complete the task.

Question 44

Answer: C

Explanation:

Short-term memory has a capacity of 5-9 items and this lasts for up to 30 seconds, although the average is approximately 18 seconds.

Question 45

Answer: C

Explanation:

Actively observing her father is the characteristic of attention and picking up the ball and kicking it demonstrates reproduction.

Question 46

Answer: B

Explanation:

The symptoms of Parkinson's disease are largely caused by a lack of dopamine producing neurons in the substantia nigra.

Question 47

Answer: A

Explanation:

A predisposing factor will increase the risk of onset of a mental illness, but will not guarantee it. Genetic factors associated with heredity are an example of a predisposing factor that is biological in nature.

Question 48

Answer: C

Explanation:

The white object was associated with the loud bang and this produced a conditioned response of fear (because of the white object)

Question 49

Answer: D

Explanation:

Because Mr Black was in a different environment (context) when he saw the student in the supermarket, his failure to recall could be the result of a lack of appropriate context dependent cues.

Question 50

Answer: B

Explanation:

Knowledge of the student's name is an example of a semantic memory.

SECTION B: Short-answer questions

Question 1 (4 marks)

Bright light therapy would involve exposing Jessica to intense, but safe amounts of UV light as a way of suppressing the secretion of sleep hormones to stay awake (1 mark). This will regulate her sleep-wake cycle if exposed to the light in the morning so that she is made more alert during the day at her home time zone (1 mark).

Cognitive behavioural therapy will assist in correcting Jessica's faulty thinking and thoughts around sleep (cognitive aspect; 1 mark) as well as assisting her in developing more healthy sleep behaviours, such as not using technology around bedtime and preventing exposure to blue light that will suppress the release of sleep inducing melatonin (1 mark)

Question 2 (12 marks)

a.

- i. Phillip is likely to be in an altered state of consciousness (1 mark) and Harvey is likely to be in normal waking consciousness (1 mark)

2 marks

ii. Students can select one of the following objective measures

- EEG, where Phillip will likely show alpha waves and Harvey showing beta waves, showing Harvey is more alert.
- EMG, where Phillip will likely show a decrease in muscle tension in comparison to Harvey, showing Harvey is more alert.
- EOG, where Phillip will likely show a decrease in rapid movement of the eyes in comparison to Harvey, showing Harvey is more alert.
- Measurement of speed and accuracy on cognitive based tasks, where Phillip is likely to perform worse on such tasks in comparison to Harvey, showing Harvey is more alert.

Students must contrast the difference in this measure between Phillip and Harvey and relate this to their level of consciousness in order to receive full marks

1 mark – correct objective measure

2 marks – discussion about how the measure could assist in identifying the level of consciousness of Phillip and Harvey

3 marks

b. Any two of the following behavioural changes will be accepted

- excessive sleepiness
- impaired regulation or control of behaviour
- reduced motor coordination, particularly eye–hand coordination
- reduced reaction time
- feelings of lethargy / lack of energy
- microsleeps
- droopy eyelids
- hand tremors
- slow / slurred speech

1 + 1 = 2 marks

c.

- i. It is likely that after the consumption of coffee, which contains caffeine, that his brainwave pattern will be elevated / heightened / increased (1 marks) in comparison to **baseline beta wave** activity which, Harvey will have been in prior to consumption of coffee (1 mark).

2 marks

- ii. Stimulants can mimic neurotransmitters in the brain, which travel across the synaptic gap. The stimulant acts as a key, with a receptor site on the post-synaptic neuron acting as a lock (1 mark). The stimulant will only bind to a receptor site on the post-synaptic neuron that has the same specific shape (1 mark). Once the stimulant is bound to the receptor site it will have an excitatory effect on the nervous system, making post-synaptic neurons more likely to fire (1 mark).

3 marks

Question 3 (9 marks)

- a. In relation to sleep, the **circadian rhythm** is the sleep-wake cycle, which explains the rhythm of wakefulness during the day for approximately 16 hours and sleep during the night for approximately 8 hours, whereas the **ultradian rhythm** is the sleep cycle itself, which explains the change to the stages of sleep that we experience during a sleep episode (1 mark). The researchers were investigating ultradian rhythm relating to sleep (1 mark).

2 marks

- b. Adolescents are known to sleep for longer periods compared to adults and the elderly (1 mark). They are also known to spend significantly more time in deep sleep stages 3 and 4 NREM compared to the elderly (1 mark). Given these differences, and because the control group was only comprised of adolescents, with the diet drink being given to adults and elderly participants, the validity of the findings are questioned because the natural differences between sleep of the groups confounds the ability of the researchers to determine the true impact that diet drinks have on sleep (1 mark).

3 marks

c.

- i. A circadian phase disorder is sleep disruptions that is primarily caused because of a mismatch between the sleep-wake pattern of an individual and what is required or desired.

1 mark

- ii. The researchers are most likely referring to the sleep wake cycle shift in adolescence (1 mark). This is thought to occur because of changes to the hormonal cycles in adolescents as a result of entering puberty, which results in a delayed release of the sleep hormone melatonin (1 mark). This results in a delay by 1-2 hours of the desired sleep time, and wake up time as a result (1 mark).

3 marks

Question 4 (5 marks)

- a. The three memory systems are sensory memory (capacity unlimited), short-term memory (5-9 items), and long-term memory (unlimited).

3 marks

- b. The hippocampus is responsible for consolidating explicit memory (1 mark) while the amygdala is responsible for attaching the emotional content experienced during an event (1 mark). These two structures work together in the process of consolidating explicit long-term memory.

2 marks

Question 5 (13 marks)

- a. The experimental design was independent groups. No other response is accepted.

1 mark

- b. The research hypothesis will vary among students. The following must be included for full marks

1 mark – Reference to the IV (anti anxiety drug)

1 mark – Reference to the DV (severity / level of anxiety)

1 mark – Providing a one-sentence statement that includes a prediction of the outcome of the research that clearly separates the control and experimental group from each other

NOTE:

- The hypothesis cannot be written as a question or stated as an aim (zero marks allocated)
- If the IV is operationalised, students must make clear reference to both the experimental and control group for the mark relating to the IV to be awarded
- A null hypothesis is not accepted (no difference between groups)
- Hypothesis does not need to be correct based on the results on the graph

3 marks

- c. Use of treatments in research are likely to lead to change in participant behaviour because of expectations of the effectiveness of a treatment, or because of beliefs the participants have about how they think the experimenter wants them to behave (placebo effect). As a result, these expectations can become a confounding variable (1 mark). The use of placebo will allow Samira to measure the amount of this effect (as researchers assume this placebo effect is the same across the experimental and control group) and determine how much of the change in the DV can be attribute to the influence of the IV, thus the validity of the findings will be improved (1 mark)

2 marks

- d. Mentally ill populations are more vulnerable, emotionally, than those of a health population. As a result, the use of placebo could:

- Produce potential emotional instability in patients who have expectations of treatments that do not work
- Result in relapse because they are required to withdraw from current treatment while participating in a study, which violates the 'do no harm' principle
- Deprive participants of treatments that could potentially improve their wellbeing

1 mark

- e. GABA is the main inhibitory neurotransmitter in the nervous system. It is responsible for reducing excitation and maintaining calm within the nervous system. Individual's with anxiety are thought to have reduced levels of GABA (1 mark) and this produces over-excitation and symptoms of anxiety (1 mark).

2 marks

- f. Students need to evaluate the effectiveness of the trial drug in comparison to current CBT treatment and no treatment at all. The following points should be discussed:

TWO statements that compare the results at 3 months and 6 months

- The trial drug reduced anxiety symptoms most at 3 months into treatment, compared to CBT and no treatment (1 mark)
- At 6 months, the current CBT treatment reduced anxiety symptoms most compared to the trial drug and no treatment (1 mark)

TWO statements that evaluate the results in terms of the trial drug effectiveness

- Results indicate that in the short term the trial drug will be more effective in treating anxiety compared to CBT however, in the long term, the use of CBT is more effective in treating anxiety (1 mark)
- This would suggest that the trial drug should not be used for the long term management of anxiety in lieu of CBT (1 mark)

4 marks

Question 6 (4 marks)

During primary appraisal, Lionel evaluated the event as a challenge and an opportunity for growth (1 mark). In secondary appraisal, he evaluated his coping resources to be adequate to manage the stress of not getting a job by seeking feedback and then practicing his interview skills with his parents (1 mark). This resulted in the ability to manage his stress.

During primary appraisal, Jackson evaluated the event as a threat as he didn't feel he would ever find a job (1 mark). In secondary appraisal, he did not feel he has sufficient coping resources, as he kept the issue to himself and did not seek to improve his skills for future interviews (1 mark). This resulted in stress.

Question 7 (13 marks)

a.

- i. Tiffany's response was a conscious / voluntary response. Spinal reflex will not be accepted.

1 mark

- ii. The detection of the spider was made through sensory receptors and sent through sensory neurons via afferent pathways to the brain for processing (1 mark). Following processing, a signal is sent via motor neurons using efferent pathways to the arm instructing Tiffany to shake (1 mark).

2 marks

- b. The phobia could have been precipitated through classical conditioning (1 mark), where the spider was a previously neutral stimulus that was associated fear, which became a conditioned response (1 mark). Once established, the phobia could have been perpetuated through operant conditioning (1 mark), where Tiffany and her phobia were negatively reinforced by the avoidance of spiders, which resulted in Tiffany also avoiding fear (1 mark).

4 marks

- c. Long-term potentiation involves the long lasting strengthening of neural pathways as a result of frequent activation (1 mark). Due to Tiffany's repeated avoidance behaviour (1 mark), the neural pathway that strengthens the connection between the spider and fear is strengthened, which will maintain the phobia (1 mark).

3 marks

- d. Students may select either CBT or systematic desensitisation (1 mark).

The use of CBT would involve changing faulty thinking patterns relating to spiders (1 mark) and then working to develop more adaptive behaviours and changing Tiffany's avoidance behaviour (1 mark)

OR

Systematic desensitisation would be used to develop a fear hierarchy for Tiffany of least to most anxiety provoking (1 mark) and then working from the least anxiety provoking to most anxiety provoking, coupled with relaxation techniques, each situation would be worked through until the fear response is extinguished at each level before moving to the next, until the phobia is extinguished (1 mark)

3 marks

Question 8 (10 marks)

The question requires students to develop a report from a psychologist that evaluated the presence of a mental disorder / illness in a patient who appears to have a phobia of birds. The report needed to justify the diagnosis / evaluation based on the typical characteristics of mentally healthy people. Furthermore, the report needed to include an explanation on how the behaviour developed, taking a perspective from social learning theory.

This question draws on student knowledge from:

Unit 4, Area of study 2 – What influences mental wellbeing

- Mental health as a continuum (mentally healthy, mental health problem, mental disorders) influenced by internal and external factors that fluctuate over time
- The typical characteristics of mental healthy people, including high levels of functioning, social and emotional well-being and resilience to life stressors

Unit 3, Area of study 2 – How do people learn and remember

- Observational learning as a method of social learning, particularly in children, involving attention, retention, reproduction, motivation and reinforcement

Responses are to be marked holistically, taking into account the clarity and organisation of the content, and the degree of sophistication with which the relevant psychological concepts and terminology are integrated into the response, how well psychological concepts and terms were applied to relevant aspects of the scenario, and the extent and depth to which all requirements of the response were addressed.

Students who validly attempt all aspects specified in the question are to be awarded **at least five marks out of 10**, with the awarding of higher marks being dependent on the level of critical appraisal and application to psychological theory demonstrated.

It is acceptable for students to structure their responses in different ways, but the selected structure must ensure that required information for the response can be presented in a cohesive, logical way.

The following is a marking scheme that will guide the assignment of marks for this response.

Marks	Descriptors
9-10	A comprehensive, detailed and clearly organised response, presented in the form of a report from a psychologist, and shows a high level of understanding of criteria for presence of a mental illness. At this level, students will provide a succinct description of the topics required by the question: • Clear identification of Gemma experiencing a phobia, which is a mental illness • Discussion of the lack of characteristics of mentally health people in terms of deficits in functioning (it is not a high level), and resilience to life stressors (especially potential exposure to birds). There does not appear to be lack of social wellbeing, but Gemma does show signs of reduced level of emotional control. • Discussion of all five aspects of observational learning and how these interacted to contribute toward the onset of the phobia. The highest responses may also make reference to transmission of threat information when discussing observational learning.
7-8	Responses in this range will still show a relatively detailed and clearly organised report of the status of the individual's mental health <u>to most of the concepts</u> required by the question. There will be a lack of detail in responses in this range relative to more sophisticated responses. e.g. – student may not discuss all factors in observational learning through transmission of threat information that lead to the development of the phobia OR the student may only discuss one characteristic of mentally healthy people.
5-6	A satisfactory evaluation of the patient's mental health (mental disorder) and characteristics of mentally healthy people. Discussion of how social learning theory influenced the development of the phobia was also attempted.

	<u>6 mark responses</u> will identify all that is required for 5 marks, and <i>additionally</i> will elaborate on one of the points below; • Will explain why a mental illness is present • Make reference to more than one characteristic of mentally healthy people • Elaborate in greater detail <u>at least two</u> stages of observational learning and how they apply to Gemma <u>5 marks responses</u> will identify the presence of a mental illness (not a mental health problem) and provide a brief description of how Gemma's behaviour demonstrates a lack of some characteristics of mentally healthy people. Reference to the scenario involving her mother and a brief discussion of how social learning theory influenced the phobia was made. Responses that show less than this cannot be awarded anything more than a 4. <i>NOTE: a score of 5 is a passable mark that addresses all basics that are required by the question.</i>
3-4	A limited understanding of the position of an individual along the mental health continuum, and characteristics of mentally healthy people. Responses in this range will have demonstrated some understanding of <u>at least one</u> of the topics required in the prompt.
1-2	A very limited report was developed. There is a lack of structure and format relevant to the prompt. Little to no analysis of the status of the individual's mental health, with justification and reference to social learning theory were discussed / were not accurate.
0	The response provided by the student is largely irrelevant and/or inaccurate