2019 VCE Psychology examination report

General comments

The 2019 VCE Psychology examination assessed Units 3 and 4 of the *VCE Psychology Study Design 2014–2021*. Section A comprised 50 multiple-choice questions worth one mark each. Section B comprised seven short-answer questions worth 60 marks and one extended-response question worth 10 marks.

The examination reflected the structure of the study design, with a focus on scientific literacy and experimental design. The questions reflected the interconnectedness of different Areas of Study as well as the relationship between key knowledge and key science skills in the study design.

All students provided a response to every multiple-choice question. This is strongly advised even if the answer is unknown. It is possible to change a response by carefully erasing and re-shading.

Students should write within the marked boundaries for each question, clearly indicate if a response is continued in the extra space provided at the end of the question and answer book, and ensure that any continued response is numbered.

For short-answer questions and the extended response, students should clearly address each question as it was asked and ensure that any examples they provide are relevant. It may help to begin each answer using the terms of the question. In questions that require the application of psychological knowledge to a scenario, students should make clear and relevant references to the scenario. Generic responses cannot be awarded full marks. Students should attempt to answer all parts of each question, to be eligible for full marks.

Although spelling errors are not penalised, the meaning of the response must be clear and unambiguous. If a key term in a response spells another word (such as 'semantic' instead of 'somatic') then no marks can be awarded. Students should take care to spell key terms from the study design correctly.

Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

Section A – Multiple-choice questions

Most multiple-choice questions related to a scenario, with 29 of the 50 questions relating to one of eight scenarios associated with multiple questions, sometimes spread over more than one page.

The table below indicates the percentage of students who chose each response option. The correct answer is indicated by grey shading. There were 14 questions for which most students did not select the right option. These are the focus of the comments provided.

Question	% A	% B	% C	% D	Comment
1	93	1	1	4	
2	17	66	8	10	Use of the word 'decision' in Option B was considered to be incompatible with a reflex response.
3	2	8	11	79	
4	2	93	3	2	
5	7	67	11	14	
6	8	11	68	13	
7	12	18	20	50	
8	3	5	3	89	
9	1	61	32	6	
10	6	27	26	41	To select Option D students had to infer that stress level was operationalised as a single change score derived from averaging the two separate change scores that could be calculated for each of the electromyograph (EMG) and EMG arousal scores. The change score was the best response because Ravi's aim was to find out whether the coping strategy used would 'affect their baseline levels of stress'. The change score operationalises the difference between baseline and coping strategy stress levels.
11	47	15	25	13	This result indicates a need for better understanding and application of the precise definition of the term 'confounding variable'. A confounding variable is a variable that has the potential to directly and systematically affect the measurement of the dependent variable. Option A was expressed in generic terms, but was the only option that relates to a true confounding factor, rather than to the effect of a bias, a problem with generalisability, or artificial restriction of available coping strategy.
12	69	21	8	1	
13	9	69	4	18	
14	8	12	55	25	
15	85	5	4	6	

Question	% A	% B	% C	% D	Comment
16	79	8	4	9	
17	23	10	30	36	Option C was incorrect as the response to an unconditioned stimulus is always an unconditioned response. Option A appeared plausible because to learn a classically conditioned response to the formerly neutral stimulus, the conditioned stimulus must come to elicit the reflex response.
18	4	1	90	6	
19	2	48	21	29	The preference for Option B may reflect confusion between the use of the word 'reconstruction' in the context of Loftus's work on the reconstructive nature of memory, and the very specific use of the term intended in Unit 3, Area of Study 2.
20	16	6	73	5	
21	1	83	3	12	
22	23	1	4	72	
23	8	7	6	79	
24	12	11	25	51	
25	7	52	34	7	Option C was the best response. Counterbalancing would be essential in this study to neutralise the potentially confounding effect of time of testing on memory performance, and practice effects from task 1 to task 2. The question required the application of similar knowledge to Question 11, and depended on a good understanding of the role of counterbalancing in minimising the impact of practice effects in repeated measures designs.
26	45	40	10	6	The automatic processing referred to in Option B was not a reason for Miran to miss the phone call. The task of reading the newspaper requires concentration and comprehension of complex ideas, which would lead to content limitations in attending to the ringing phone.
27	5	59	11	25	
28	7	41	3	49	Option D implied daydreaming, which would not be as focused as the thoughts described in the scenario.
29	32	36	29	4	Option A described a behavioural response, as required by the question, rather than a cognitive response.
30	92	5	0	3	
31	23	33	42	2	Option C was the best response as the question refers specifically to the effect on Phoenix's concentration.
32	10	2	69	19	
33	7	72	13	7	
34	56	18	21	5	

Question	% A	% B	% C	% D	Comment
35	6	18	10	65	
36	1	20	76	3	
37	3	28	1	68	
38	1	12	24	63	
39	4	41	13	43	A and C would both improve the design of the study and the quality of the data but D would result in a sample that is both larger and more representative, increasing generalisability.
40	29	41	6	23	A, C, and D were all social risk factors related to stigma associated with mental health issues that increase the likelihood of the development and progression of a mental illness Option B was the best response because although people with a mental illness may perceive themselves differently from others, this does not necessarily relate to stigmatisation.
41	3	7	76	14	
42	12	72	4	11	
43	1	6	88	5	
44	7	75	1	17	
45	91	3	3	3	
46	5	2	4	89	
47	3	9	75	12	
48	4	82	5	8	
49	19	23	53	4	Option C was the best response because both strategies clearly addressed cognitive rather than behavioural responses.
50	35	14	46	5	It was considered that although the type of data, data collection method and sample size in Options A and C were congruent, they were best matched to a qualitative case study methodology in Option A.

Section B

Question 1

Marks	0	1	2	3	4	5	Average
%	30	16	11	15	17	11	2

There were three valid interpretations of this question. Full marks could be achieved by providing an accurate identification and a correct and coherent outline of the involvement of any one of the following in activating the response:

- the somatic nervous system
- the brain
- the autonomic nervous system.

Responses indicating that the spinal cord activated the response were incorrect as the scenario clearly described a conscious action. A response identifying the autonomic nervous system was considered valid if it described accurately how an autonomic flight response might alert the conscious decision-making system to the need to move away from the fire, thus being the subdivision that 'activated' the conscious response. The range of responses accepted reflected the wording of the scenario, and valid understandings of the word 'activated' in the context of the nervous system.

Question 2a.

Marks	0	1	2	3	Average
%	18	16	31	35	1.9

Students were awarded one mark for each of the following:

- correct identification of dopamine as the neurotransmitter
- identification of the degeneration/loss of dopamine-producing neurons as a central feature of Parkinson's disease
- explanation of the role of dopamine in the symptoms of muscle rigidity and balance problems.

Question 2b.

Marks	0	1	2	Average
%	44	37	19	0.8

Students were awarded one mark for each of the following:

- demonstration of definitional knowledge of the term 'life event', as a significant (major, stressful) episode (occurrence) that forces (requires) an individual to adjust (change, adapt) their life to manage new circumstances
- appropriate application of the term 'life event' to Elliot's circumstances.

Both the significance of the event and requirement for adaptation were required for one mark. For two marks, the answer also had to include a relevant example of how Elliot could be impacted and/or how he would need to adjust to his father's condition.

The following is a sample response.

Bob's diagnosis with Parkinson's disease is a stressful event that forces Elliot to adjust his life to manage the consequences of caring for his father. Elliot might need to take a more active and time-consuming role in caring for his father and have much less time available for himself.

Question 2c.

Marks	0	1	2	3	Average
%	12	21	42	24	**1.8**

Marks were awarded as follows:

- One mark for accurate identification of an acceptable (coping) strategy from any of approach, avoidance, exercise, adequate diet, sleep, Cognitive Behaviour Therapy (CBT) or social support. Students might also have referred to emotion- or problem-focused strategies; even though these terms are no longer specified in the study design, they are part of the Transactional Model of stress and coping.
- Two marks for an accurate description of how the strategy could help Elliot maintain his resilience, showing understanding that resilience refers to maintaining mental health in the presence of life-stressors, and a valid and congruent example of the strategy named in relation to the scenario.

The adjustments Elliot makes to his life could have been physical or psychological. It was not sufficient to use the term 'resilient' without demonstrating an understanding of the term; for example, merely naming a strategy that would 'help him stay resilient'.

Question 3a.

Marks	0	1	2	3	Average
%	33	29	27	10	**1.2**

One mark was awarded for each of the following:

- correct identification of the neutral stimulus (NS) as the snake and the unconditioned stimulus (UCS) as the electric shock (from the collar)
- trainer presents the snake (NS) immediately followed by, or simultaneous with, the shock (UCS)
- demonstrating understanding that the repeated association formed between the snake and the shock causes the snake to become a conditioned stimulus that comes to produce a conditioned fear response when it is presented on its own (resulting in avoidance of the snake).

Commonly used acronyms relating to classical conditioning were allowed. The collar or shock collar could **not** be named as the UCS; the UCS is the electric shock. The UCR is the fear response.

If a flow chart was used, it needed to state explicitly that the NS comes before (or simultaneously with) the UCS. Writing 'NS + UCS' was not sufficient for the assessor to infer that the student understood the importance of the order of stimulus presentation.

The following is a sample response.

The animal trainer creates a conditioned fear response to snakes by presenting the dog with a snake, the NS, followed by the electric shock, the USC [2 marks]. Over repeated trials, the dog learns the association between the snake and the shock, producing a conditioned fear response to the snake when it is presented on its own [1 mark].

Question 3b.

Marks	0	1	2	3	Average
%	13	22	24	42	**2**

One mark was awarded for each of the following:

- identifying the snake as the Antecedent
- identifying avoidance of the snake (not approaching the snake) as the Behaviour
- identifying positive reinforcement as the Consequence (with treat given for avoiding/not approaching the snake in the second method used in each training session).

Stating 'treat' alone was not sufficient for the Consequence.

Question 3c.

Marks	0	1	2	Average
%	50	46	3	**0.6**

Two marks were awarded for a response that provided two valid reasons why a negative (painful, fearful, aversive, unpleasant, punishing) stimulus is effective for establishing an avoidance response to a formerly neutral stimulus (the snake). Possible reasons included:

- Negative (unpleasant, painful, punishing) stimuli, like an electric shock, act as powerful unconditioned stimuli for training avoidance of the neutral stimulus because they produce a reflexive fear response that becomes strongly associated with the neutral stimulus, in this case the snake.
- Negative stimuli that cause a startle or pain response are strongly related to innate survival mechanisms and so make strong unconditioned stimuli to associate with a neutral stimulus that you want the learner to avoid.
- Learning can occur very quickly when negative stimuli that are related to survival, such as pain or shock, are used as the unconditioned stimulus.
- Negative stimuli engage powerful emotional learning via the amygdala and so create a strong association with the neutral stimulus.

Some students had difficulty understanding the use of the term 'negative stimulus' as referring to the electric shock, and/or attached it incorrectly to the snake as something to learn to avoid.

Question 4a.

Marks	0	1	2	Average
%	34	8	57	**1.3**

Two marks were awarded for correct identification of one key difference between insomnia (Claire) and sleepwalking (Jack) using two appropriate psychological terms (one relating to each condition). Acceptable responses included:

- classification as dysomnia vs. parasomnia
- difference in level of consciousness as conscious vs. unconscious
- Claire's problem is affecting the amount of sleep she will get whereas Jack's problem is affecting the quality of sleep.

Students could be awarded one mark only for stating 'Jack has a parasomnia and Claire doesn't.'

Students could **not** be awarded a mark for noting the difference as being that Claire's problem occurs while trying to get to sleep, whereas Jack's occurs during sleep.

Question 4b.

Marks	0	1	2	3	Average
%	22	29	38	10	**1.4**

One mark was awarded for each of the following:

- Explaining how the cognitive aspect of CBT could be applied to treat Claire's insomnia
- Explaining how the behavioural aspect of CBT could be applied to treat Claire's insomnia
- Demonstrating knowledge that the changes in thinking lead to changes in behaviour, or that change in behaviour leads to change in thinking.

The following is a sample response.

Cognitive Behaviour Therapy (CBT) could be used to treat Claire's insomnia by helping her to challenge negative beliefs about her ability to alter her sleep patterns. These changes in Claire's thinking could help her to develop new patterns of behaviour related to sleep that support good sleep hygiene, such as replacing her nightly coffee with a mug of warm milk.

Question 4c.

Marks	0	1	2	Average
%	16	43	41	**1.3**

One mark was awarded for each of the following:

- any one valid subjective reporting method, including a sleep diary/journal, self-report, questionnaire or interview
- one valid and congruent form of qualitative data that the named method could provide to inform the psychologist about Claire's experiences with sleep/insomnia (for example, information about quality of sleep, thoughts, feelings, emotions, dream descriptions).

Responses could **not** gain marks for referring to quantitative data (even if self-reported), such as time of getting to sleep, number of wakings during the night or time of waking.

It was not sufficient to just say 'diary'; the response needed to be specific to sleep.

The qualitative information needed to link to Claire's experiences of sleep, insomnia and/or the impact on her functioning. Simply referring to 'her thoughts/feelings' was not sufficient.

If the reporting method section was left blank the student was not eligible for any marks because the second part of the response depended on the first.

Question 4d.

Marks	0	1	2	3	Average
%	24	27	22	28	**1.6**

One mark was awarded for each of the following:

- Correct identification of the stage(s) of sleep during which sleepwalking typically occurs as any of non-rapid eye movement (NREM) Stage 3; NREM Stage 4; NREM Stages 3 and 4.
- Demonstrating accurate knowledge of the restoration theory of sleep, specifically as it relates to NREM Stages 3 and/or 4 in repair of body and regeneration of cells.
- Accurate description of the likely impact of sleepwalking/disruption of NREM Stages 3 and/or 4 sleep according to the restoration theory of sleep; for example, 'is likely to experience fatigue the next day'.

NREM could be missing from the response, as REM does not have stages. Neither 'stage' nor 'sleep' was required in the first part of the response because the word 'Stage(s)' was given as a prompt, and sleep is clearly implied. However, if NREM was not stated explicitly within the first part of the response, it had to be included somewhere else for any further marks to be awarded. A maximum of one mark was awarded if NREM was not included.

Question 4e.

Marks	0	1	2	Average
%	21	41	38	**1.2**

One mark was awarded for each of the following:

- Explanation of why video recording would be an appropriate method for monitoring Jack in the sleep clinic rather than EMG.
- A drawback of using EMG in this case: although EMG measures muscle activity, it cannot inform us whether sleepwalking is occurring as opposed to normal movement while asleep. Alternatively, EMG could limit movement through (potential) attachment of wires to a machine.

The reference to EMG had to demonstrate knowledge of what it records.

Question 5a.

Marks	0	1	Average
%	59	41	**0.4**

Students were awarded one mark for accurately describing the dependent variable as the mean percentage of letters correctly identified. The response had to include **all** of the following:

- reference to the mean as the summary statistic used to compare performance on the letter identification task
- the unit of measurement as a percentage
- reference to what was measured (letter identification accuracy).

Question 5bi.

Marks	0	1	2	Average
%	38	33	29	**0.9**

One mark was awarded for each of the following:

- correct identification of the circadian phase disorder as any of sleep-wake shift, delayed sleep-phase onset, adolescent phase delay or adolescent sleep onset disorder
- accurate description of sleep-wake shift in adolescence as the delayed onset of sleep and waking in adolescence or delayed body clock/circadian rhythm.

As only one mark was allocated for the description, students were not required to include information about why the delay occurs. Sleep deprivation could not be accepted as an alternative response for the likely circadian phase disorder. If the identification of the circadian phase disorder was incorrect, the response was not awarded any marks.

Question 5bii.

Marks	0	1	2	Average
%	50	33	17	**0.7**

One mark was awarded for each of the following:

- Accurate prediction that adding younger adolescents to the sample would likely result in the mean accuracy of letter identification performance for the sample being decreased. Alternatively, there would be an increase in the number of errors.
- Accurate justification of the predicted effect in terms of the timing of the test being at a time that some of the younger adolescents would be feeling sleepy as a result of their phase-shifted rhythms, affecting their ability to concentrate on the letters; or, the accumulated impact of sleep debt, due to the likelihood that some of the younger adolescents would be experiencing the ongoing effects of the sleep-wate shift on their concentration.

The scenario and question required that the prediction in the response relate to adding the younger adolescents to the existing sample, rather than creating a separate comparison group.

It was sufficient for one mark to note the overall likely impact on the data in terms of reduced mean accuracy of letter identification performance.

Students who simply wrote that 'it would affect the accuracy of the results' could not be awarded any marks as this does not clearly demonstrate that it is the overall mean accuracy for the sample that will be lowered, rather than making the results less accurate. Students need to ensure their intended meaning is conveyed precisely.

The following is a sample response.

Adding adolescents under 18 to the sample would most likely result in a reduction in the mean accuracy of letter identification for the sample. This is because the later shift in their circadian rhythms will cause the adolescents under 18 to be sleepy in the morning, with the 9 am testing time likely to interrupt a time when they would ideally still be asleep.

Question 5c.

Marks	0	1	2	3	Average
%	34	29	28	9	**1.1**

One mark was awarded for each of the following:

- Framing the conclusion with reference to the actual research that Steph conducted with the sample described, 'people over the age of 18'. The question clearly asked for a conclusion that could be drawn from Steph's research, requiring students to make a distinction between the research aims and how those aims were operationalised.
- Stating the direction of the results in terms of the mean accuracy of letter identification being lower (reduced, negatively impacted) in the partially sleep deprived condition.
- Referring to the relationship between the independent variable (IV) and the dependent variable (DV). This could be stated in general terms as the effect of sleep deprivation versus natural sleep on accuracy of visual perception, or operationalised as the effect of four hours of sleep compared to a night of natural sleep on mean accuracy for identifying letters.

The statement of the conclusion needed to be congruent with a repeated measures design.

Students who phrased their conclusion as a hypothesis could receive no marks.

Conclusions from data presented in research scenarios in VCE Psychology can only be drawn with direct reference to the sample studied, and based on whether observed patterns in the descriptive

statistics are consistent or not with some proposed hypothesis. The use of phrases such as 'performed significantly worse' are not appropriate as this implies statistical significance.

An acceptable alternative response was to argue that no valid conclusion could be drawn for Steph's study due to any of the following:

- the study was not a valid study of the stated aims and/or research questions.
- valid examples of the likely effect of the various extraneous and uncontrolled variables evident on ability to draw a valid conclusion
- lack of inferential statistics restricting conclusions to the patterns evident in the sample means.

The following are sample responses.

While it is not possible to apply the findings of the present study to learner and P-plate drivers specifically, nor to visual perception while driving, the results are consistent with the hypothesis that the visual perception of adults is impaired after sleeping for only four hours compared to a natural night of sleep.

and

Steph can conclude that adults who experienced a natural night of sleep performed more accurately on a test of visual perception than when they had had only four hours sleep.

and

Steph cannot draw any direct conclusions about the impact of staying up late to study on the visual perception of L- and P-plate drivers while driving. This is because it is not clear that her sample consisted of L- and/or P-plate drivers, and because the test of visual perception accuracy was not conducted under driving conditions.

Question 6a.

Marks	0	1	2	3	Average
%	43	10	18	29	**1.3**

One mark was awarded for each of the following:

- naming negative reinforcement as the relevant form of reinforcement
- explaining how use of the night light reduces the fear associated with an unpleasant stimulus
- explaining how reduction of an unpleasant stimulus serves to make the behaviour more likely to persist in future.

'Positive reinforcement' was not accepted because the rewarding consequence of the behaviour of using the night light is to reduce the effect of an unpleasant stimulus.

The following is a sample response.

The use of the night light has been negatively reinforced because of its effect in reducing Ambreen's extreme fear response to the dark. The reduction of fear response acts to increase the likelihood that the behaviour of using a night light will continue in the future.

Question 6b.

Marks	0	1	2	3	Average
%	8	30	43	19	**1.8**

Marks were awarded as follows:

- one mark for stating Ambreen is suffering from a phobia.

- two marks for accurately defining a phobia, relating this to an example relevant to Ambreen **and** contrasting this with anxiety.

The justification needed to include reference to an example of impaired functioning from the scenario. A maximum of two marks could be awarded if the response only gave accurate definitions of phobia.

Anxiety should not have been defined in terms of a disorder; responses naming anxiety as the likely experience of Ambreen received no marks.

The following is a sample response.

Ambreen has a phobia, rather than anxiety. Phobias are characterised by a persistent, intense and irrational fear of a specific event or situation that adversely impacts functioning. In Ambreen's case, she is specifically and intensely afraid of the dark to the extent that it prevents her from socialising at night. In contrast, anxiety is a normal response to a perceived future threat.

Question 6c.

Marks	0	1	2	3	Average
%	47	37	14	2	**0.7**

Marks were awarded as follows:

- One mark for explanation of why a placebo is needed in a double-blind placebo-controlled study, demonstrating knowledge that the placebo group is used to account for the placebo effect.
- Two marks for explaining how the researcher would satisfy **at least two** ethical considerations related to using a placebo. Valid ethical considerations specifically relevant to placebo-controlled trials could include any two of the following:

  - participants are informed prior to giving consent that they may be allocated to a placebo condition and that they will not know whether they are receiving the treatment or not
  - participants are informed that they must stop other treatments during the study and that they will not know if they are receiving the test treatment
  - participants may be offered the trial drug subsequent to the study if it has been found to be effective.
  - participants should be immediately debriefed at the conclusion of the study about which group they were assigned to and advised as appropriate about resuming their previous medication
  - participants are informed of withdrawal rights specifically linked to potential negative effects of taking the placebo.

It was not sufficient to state 'to control for placebo effect' in the first part of the response without also demonstrating knowledge of what the placebo effect is.

The following is a sample response.

A placebo group, where participants are administered an inactive substance (fake drug), is needed to allow the researchers to determine whether the benzodiazepine has a true therapeutic effect beyond the effect of participant expectations. The researcher could satisfy the ethical considerations arising from placebo-controlled trials by ensuring that participants only consent to participate after they have been fully informed and understand that they may be allocated to the placebo condition. During debriefing participants should also be informed which condition they were assigned to in order to reduce any potential harm from falsely believing that they may have received an effective treatment.

Question 7a.

Marks	0	1	2	3	Average
%	28	25	29	19	**1.4**

One mark was awarded for each of the following:

- Knowledge of biological risk factors through either definition and/or examples that relate to the accumulation of biological factors. Acceptable biological factors included genetic predisposition to mental illness, poor response to medication, poor sleep and substance use. At least two factors were required.
- Understanding of cumulative risk for developing a mental health disorder.
- Effective application of knowledge of the potential effect of cumulative biological risk factors to the context of the Mars mission.

The following is a sample response.

Cumulative risk refers to the compounding impact of multiple risk factors in increasing the likelihood of a person developing a mental health disorder. The accumulation of multiple biological risk factors could include a genetic predisposition to developing mental illness, combined with a poor diet. As the mission will be long and psychologically stressful, it would be important to screen out applicants who display multiple biological risk factors as they would be at increased risk of developing a mental illness during the mission, potentially endangering themselves and others.

Question 7b.

Marks	0	1	2	Average
%	17	36	47	**1.3**

One mark was awarded for each of the following:

- Identification of one typical characteristic of a mentally healthy person that is relevant to the role of an astronaut, which may have included any of:

  - high levels of functioning
  - social wellbeing
  - emotional wellbeing
  - resilience
  - ability to form positive relationships
  - good quality sleep
  - physical activity
  - good self-efficacy
  - absence of distress, dysfunction and/or deviant behaviour.

- Valid and congruent description of how a psychologist may observe the characteristic at interview. These may have included any of:

  - observing the relevant characteristic during interview
  - answers to direct questions about any of the above characteristics
  - appropriate answers related to the characteristic on psychological tests.

The characteristic needed to be a recognised term from Unit 3 or 4 of the study design and be relevant to the role of an astronaut.

Question 7c.

Marks	0	1	2	Average
%	60	30	10	**0.5**

One mark was awarded for each of the following:

- a valid reason as to why using observational study would be preferred for this kind of investigation, such as enabling the natural responses of the astronauts to real-life situations on board the mission to be documented with minimal disruption; avoiding artificially constraining the behaviour of the astronauts; or collecting a rich set of behavioural data.
- a valid reason why an experiment would be less appropriate in this context, such as participant expectations biasing results; producing artificial responses to artificial situations or requiring the control of variables that may compromise/interfere with the mission.

Students had to directly compare a valid advantage of the observational study in the context of the scenario to one drawback of an experiment in that context.

Question 7di.

Marks	0	1	Average
%	32	68	**0.7**

One mark was awarded for the correct identification of the contemplation stage.

Question 7dii.

Marks	0	1	2	Average
%	45	25	30	**0.9**

The question did not explicitly require students to name the next stage (preparation), only to outline what Justin would need to do to reach the next stage. As such, this part of the question required students to demonstrate knowledge of what is involved in the contemplation stage, and what is needed in order to move beyond it. One mark was awarded for each of the following:

- noting that to move to the next stage Justin needs to address the barriers preventing him from making a decision
- a relevant example of something Justin could do to help him stop worrying about his suitability for the mission and enable him to be ready to apply in the next round; for example, planning to see a psychologist for help in resolving his concerns about his ability to manage stress.

Question 8

Marks	0	1	2	3	4	5	6	7	8	9	10	Average
%	8	5	7	12	19	17	17	10	5	1	0.2	**4.4**

Responses were marked holistically, and were eligible for at least five marks if they:

- provided an adequate and accurate description of the Atkinson and Shiffrin model, including the function of the three stores and at least some aspects of their capacity and duration
- included a demonstration of knowledge of the roles of short- and long-term memory (and related processes) within the model in **both** forming and retrieving explicit long-term memories
- related the above to at least one valid example from a person's memories of their first day at secondary school

- made some attempt to integrate at least one other relevant concept, theory or piece of evidence from Unit 3 within their response.

Marks were awarded based on the extent to which responses were clearly expressed and well organised, prioritised the most relevant concepts, theories and evidence, provided clear and relevant examples, and made insightful links between relevant areas of knowledge.

It was possible to achieve full marks by writing within the space provided for the response – writing more did not necessarily lead to students achieving more marks.

Responses may have included, but were not limited to:

- An outline of how the Atkinson Shiffrin multi-store model of memory explains the flow of information in memory formation and retrieval with reference to function, capacity and duration of each store.
- Interactions between specific regions of the brain in the formation of a person's long-term memories of their first day at secondary school, including implicit and explicit memories. For example, if a person learnt a new game of hopscotch – an implicit memory – the cerebellum would be involved in the formation and retrieval of that memory. However, learning new facts (explicit semantic memories) would be consolidated by the hippocampus and stored in the cerebral cortex. The amygdala would help consolidate the emotional memories of something like a person making a friend on their first day, feeling nervous or being bullied.
- Methods to retrieve information from memory or to demonstrate the existence of memories, such as recall, recognition, relearning and reconstruction, and their impact on the ability to remember. For example, a person may not be able to retrieve the name of their English teacher, but they might be able to recognise the name if they hear it.
- Factors influencing a person's ability and inability to remember information in relation to their first day at secondary school, including context and state-dependent cues, maintenance and elaborative rehearsal, and serial position effect. For example, state-dependent cues may be involved in recalling information about an emotional event, such as feeling embarrassed in class when the teacher mispronounced their name.
- The reconstruction of memories as evidence of the fallibility of memory, with reference to Loftus's research and how it might apply in context. For example, if parents asked their child a question about their first day, the wording of the question could lead to new information being incorporated in the child's memory. The child's memory could be a reconstruction rather than a true representation of what happened.
- Neural plasticity and changes to connections between neurons (including long-term potentiation and long-term depression) as the fundamental mechanisms of memory formation. Whether a long-term memory forms or long-term potentiation occurs in relation to information or experiences from their first day will be affected by things such as repetition, the neurotransmitter glutamate and emotions experienced at the time. Adrenaline affects the consolidation of emotional memories, so the person may vividly remember details such as the curly hair of the student who tripped them over.
- The role of neurotransmitters and neurohormones in the neural basis of memory and learning (including the role of glutamate in synaptic plasticity and the role of adrenaline in the consolidation of emotionally arousing experiences) associated with the formation of a person's memories.
- The role of different models of learning and likely demonstration of learning as evidence of the formation and retrieval of new memories of a person's first day at secondary school. If a parent asks their child to show them what they learned at school on the first day, what is retrieved can be explained in terms of observational learning. The child must be motivated and carefully attend to the information or process, and be able to form a mental representation of it for reproduction to occur. Reinforcement may affect the likelihood of it being reproduced.

- Other information from Units 3 and 4 connected with the formation and retrieval of a person's memories of their first day at secondary school.