1 (a) Read the item and then answer the questions that follow.

A researcher investigating the multi-store model of memory tested short-term memory by reading out loud sequences of numbers that participants then had to repeat aloud immediately after presentation. The first sequence was made up of three numbers: for example, 8, 5, 2. Each participant was tested several times, and each time the length of the sequence was increased by adding another number.

Use your knowledge of the multi-store model of memory to explain the purpose of this research and the likely outcome.

(4)

(b) After the study was completed, the researcher decided to modify the study by using sequences of letters rather than numbers.

Suggest **one** 4-letter sequence **and one** 5-letter sequence that the researcher could use. In the case of **each** sequence, give a justification for your choice. Use a different justification for each sequence.

(4)

(Total 8 marks)

2 The multi-store model of memory has been criticised in many ways. The following example illustrates a possible criticism.

Some students read through their revision notes lots of times before an examination, but still find it difficult to remember the information. However, the same students can remember the information in a celebrity magazine, even though they read it only once.

Explain why this can be used as a criticism of the multi-store model of memory.

Extra space

(Total 4 marks)

3 Annie can still skateboard even though she hasn't skated for many years.
Germaine can still recall what happened on his first day at university even though it was ages ago. Billy remembers the names of the tools he needs to repair the broken tap.

Identify **three** types of long-term memory and explain how **each** type is shown in **one** of the examples above.

(Total 6 marks)

4 An experiment was carried out to investigate the working memory model.

One group of participants was asked to carry out two visual tasks at the same time. A different group of participants was asked to carry out a visual task and a verbal task at the same time.

The results showed that the participants who carried out two visual tasks at the same time performed less well on the tasks than participants who carried out a visual task and a verbal task at the same time.

Use your knowledge of the working memory model to explain this finding.

(Total 3 marks)

5 Outline **one** strength and **one** limitation of the working memory model.

Strength

Extra space

(2)

Limitation

Extra space

(2)

(Total 4 marks)

6

(a) In the context of explanations of forgetting, what is meant by *interference*?

(2)

(b) Choose **one** study in which the effects of interference were investigated. Briefly outline what the participants had to do in the study.

(2)

(c) Briefly discuss **one** limitation of interference as an explanation of forgetting.

(3)

(Total 7 marks)

7

Read the item and then answer the question that follows.

> Martin is studying for his modern language exams. He revises French followed by Spanish on the same night and then gets confused between the two: for example, he remembers the French word for 'chair' instead of the Spanish word for 'chair'. Sometimes, his mum helps to test Martin's vocabulary. When he is unable to remember a word, his mum tells him the first letter, then he can often recall it correctly.

Discuss **two** explanations for forgetting. Refer to Martin's experiences in your answer.

(Total 12 marks)

8

Jenny was standing at a bus stop talking on her mobile phone. The weather was wet and cold. Two men in the bus queue started arguing. One of the men was stabbed and badly injured. Later that day the police questioned Jenny, using a cognitive interview. They asked her to report everything she could remember about the incident even if it seemed unimportant.

Apart from 'report everything', explain how the police could use a cognitive interview to investigate what Jenny could remember.

In your answer you must refer to details from the passage above.

Extra space _____

(Total 4 marks)

9 A researcher carried out an experiment to investigate misleading information. Participants were shown a photograph in which a man and a woman were talking. The photograph was then taken away and the participants were asked questions about it. Participants were randomly allocated to condition one or condition two.

Participants in condition one were asked:
Question A "How old was the youth in the photograph?"

Participants in condition two were asked:
Question B "How old was the man in the photograph?"

(a) Why is **Question A** an example of misleading information?

(2)

(b) Name an appropriate experimental design which could be used in this experiment.
Explain why a repeated measures design would be unsuitable to use in this experiment.

Experimental design _____

_____

Explanation _____

_____

_____

_____

_____

_____

Extra space _____

_____

_____

_____

(4)

(c) Explain why it would be appropriate to use a pilot study as part of this experiment.

_____

_____

_____

_____

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_____

Extra space _____

_____

_____

_____

(4)

(d) In this experiment, participants were asked to look at a photograph rather than watch a live conversation. Explain **one** strength and **one** limitation of carrying out the experiment in this way.

Strength _____

_____

_____

_____

Extra space _____

_____

Limitation _____

_____

_____

_____

Extra space _____

_____

(4)

(e) Describe **at least one** other research study into misleading information. In your answer you should include details of what participants were asked to do and what results were found.

Extra space

(6)

(Total 20 marks)

Mark schemes

1

(a) **[A02 = 4]**

1 mark for each valid point as follows:

- **purpose** is to test the capacity of short-term memory.
- short-term memories are coded verbally / acoustically / task requires verbal rehearsal.
- **outcome** – most of the people tested would be able to repeat correctly a sequence of between 5 and 9 items.
- because according to the multi-store model, short-term memory has a limited capacity of 7 + or - 2.

(b) **[AO3 = 4]**

1 mark for an appropriate 4-letter sequence (to be creditworthy, this sequence should not make up a word or a recognisable abbreviation of a word, be a recognisable acronym or include multiple repetitions, eg ‘p,p,p,p’).

Plus

1 mark for appropriate 5-letter sequence (to be creditworthy this sequence should not make up a word or a recognisable abbreviation of a word, be a recognisable acronym or include multiple repetitions eg ‘p,p,p,p,p’, have any similarity to / connection with the 4-letter sequence (eg partial repetition, rhyme with).

Plus

1 mark each for any **two** valid justification points: eg

- words – have meaning – can be recalled as wholes.
- recognisable abbreviations – have meaning – can be recalled as wholes.
- acronyms – have meaning – can be recalled as whole.
- multiple repetitions – reduce cognitive demand.
- rhyming letters – reduce cognitive demand.

Do not accept the statement ‘letters must be random’ without further elaboration because random selection could, by chance, result in a word, acronym etc.

2

AO2 = 4

Candidates are most likely to focus on rehearsal. Answers could refer to the fact that mere rehearsal is too simple a process to account for the transfer of information from STM to LTM. Candidates might also point out that the type of information is important in whether it is recalled or not. For example, 1 mark for identifying rehearsal as a transfer mechanism and up to 3 further marks for explaining that even though students rehearse the information it doesn’t transfer from STM to LTM as predicted by the model. However, information in the magazine is only presented once, but it does transfer to LTM, despite lack of rehearsal.

Alternative explanations related to the MSM would be acceptable. Explanations which don't relate to the MSM (eg shallow processing) or explanations related to a single individual (eg brain damage) would not.

Candidates who state a relevant criticism of the MSM, but who make no explicit reference to any part of the observation, should be restricted to a maximum of 2 marks.

3

[AO2 = 6]

1 mark: for each correct application in recognising (naming/identifying) each type of long-term memory by matching to the person in the stem.

Plus

1 mark each for knowledge of a feature of the type of memory explained in the context of the behaviour in the stem.

- Annie's case/remembering how to skateboard is an example of procedural memory (1) because she is remembering an action or muscle-based memory (1).
- Germaine's case/remembering what happened is an example of episodic memory (or autobiographical memory) (1) because he recalls the events that took place at a specific point in time (1).
- Billy's case/remembering the names of tools is an example of semantic memory (1) because he remembers factual/meaningful information (1).

4

AO2 = 3

Participants would find it hard to do two visual tasks at the same time because they would be competing for the same limited resources of the visuo-spatial sketchpad. However, a visual task and a verbal task would use different components.

1 mark for a very brief or slightly muddled explanation eg both visual tasks use the visuo-spatial sketchpad. Further marks for accurate elaboration. For full marks students must refer to both conditions.

5

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

AO2 = 4

Likely strengths include research support such as dual task studies and physiological evidence from brain scans. Candidates may offer a comparison with the MSM and suggest WMM gives a better account of STM. Strengths may include practical applications of the model eg the phonological loop plays a key role in the development of reading, and working memory capacity might be used as a measure of suitability for certain jobs.

Likely limitations include the fact that little is known about how the central executive works or evidence from brain studies suggesting the central executive is not unitary. The model doesn't account for musical memory because participants can listen to instrumental music without impairing performance on other acoustic tasks.
Simply stating that the model does not explain LTM is not credit-worthy as a limitation. However, stating that the link between WM and LTM is not fully explained is legitimate.

Credit any acceptable strength and limitation.
For each strength and limitation, 1 mark for identification. A further mark for accurate elaboration.
For example (strength), there is evidence from dual task studies to support the model (1 mark). It is easier to do two tasks at the same time if they use different processing systems (verbal and visual) than if they use the same slave system (2 marks).
For example (limitation), the central executive is too simple / vague (1 mark). The central executive is an important / vital part of the model but its exact role is unclear (2 marks).

6

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

(a) Up to 2 marks for knowledge of interference as an explanation of forgetting.
Likely points: the theory suggests that forgetting is a result of disruption / confusion of one memory by other information (1); more likely to occur when memories are similar (1). There are two types – **retroactive** where recent information learned disrupts recall of previously stored information (1) and **proactive** where what we have already stored disrupts current learning (1). Credit explanation if embedded within an example. One mark for naming two types only.
Credit other valid points.

(b) **[AO1 = 2]**

Up to 2 marks for a description of the procedure / method of a relevant study. This must include detail of the conditions / variables / task.
Likely studies: Schmidt et al 2000 (street names and house moves) Baddeley & Hitch 1977 (rugby players, injury and number of teams played), Keppel and Underwood 1962 (trigrams), Jenkins and Dallenbach 1924 (recall after period of being awake / asleep).

(c) **[AO1 = 1, AO2 =2]**

AO1

1 mark for a limitation of the interference theory of forgetting. Likely answers: many of the studies on which the theory is based are laboratory based. Difficulty of distinguishing effects of interference from other forms of forgetting. Unsure of the mechanisms involved in interference / how and why it occurs.

AO2

Up to 2 marks for discussion of the limitation identified.

Possible answer: studies that support interference tend to laboratory based (1) where participants are required to learn similar material in a very short time-frame (1) making it more likely that interference will occur (1).

7 **[AO1 = 6 AO2 = 2 AO3 = 4]**

Level	Marks	Description
4	10 – 12	Knowledge of two explanations for forgetting is accurate and generally well detailed. Discussion is mostly effective. Application to the stem is appropriate, with clear links between the explanations and the stem content. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion sometimes lacking.
3	7 – 9	Knowledge of two explanations for forgetting is evident. Discussion is apparent and mostly effective. There are occasional inaccuracies. Application to the stem is appropriate although links to explanations are limited / absent. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately. Lacks focus in places.
2	4 – 6	Knowledge of two explanations is present. Focus is mainly on description. Any discussion is of limited effectiveness. Any application to the stem is partial. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. **OR** one explanation answered at Level 3 or 4.
1	1 – 3	Knowledge of explanation(s) is (are) limited. Discussion / application is very limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used. **OR** one explanation answered at Level 2.
	0	No relevant content.

Possible content:

- Interference is an explanation for forgetting – two sets of information become confused.
- Proactive interference is where old learning prevents recall of more recent information.
- Retroactive interference is where new learning prevents recall of previously learned information.
- Retrieval failure is where information is available but cannot be recalled because of the absence of appropriate cues.
- Types of cues that have been studied by psychologists include context, state and organisation.
- Cues improve recall if recall is in same context as learning, if the person is in same bodily state as when material was learned, if the organisation gives a structure which provides triggers, eg categories.

Application:

- French and Spanish are similar types of material which makes interference more likely.
- Recalling French word for 'chair' is proactive interference.
- Martin's mum gives him cues (first letter) which can then be used for him to access the material he has failed to retrieve.

Possible discussion:

- Use of evidence to support or contradict explanations.
- Credit evaluation of evidence where used to discuss explanations.
- Question of whether interference involves over-writing of other information.
- Role of similarity in interference and response competition.
- Issue of accessibility versus availability.
- Semantic memory more resistant to interference than other types of memory.
- General implications for revision and other situations.
- Relevant links to memory theory: eg stage at which interference might occur in the multi-store model.

Credit other relevant information.

8

AO2 = 4

The answer should clearly relate to one or more of the main techniques used in a cognitive interview (other than report everything):
Context reinstatement.
Recall from a changed perspective.
Recall in reverse order.
And / or the main additional features of the enhanced cognitive interview:
Encourage to relax and speak slowly.
Offer comments to help clarify their statements.
Adapt questions to suit the understanding of individual witnesses.
1 mark for simple identification of a relevant cognitive technique, or a very brief suggestion eg "tell me what you saw in reverse order."
2 marks for naming two or more relevant techniques or for a very brief outline of how one technique could be used eg "tell me what you saw in reverse order, starting with when the man was stabbed. A maximum of 2 marks can be awarded if there is no reference to details in the passage.
Further marks for accurate elaboration including reference to details in the passage.
Candidates who refer to only one technique should include more detail than those who refer to more than one.

9

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

Although the essential content for this mark scheme remains the same, mark schemes for the new AQA Specification (Sept 2015 onwards) take a different format as follows:

- A single set of numbered levels (formerly bands) to cover all skills
- Content appears as a bulleted list
- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

(a) **AO2 = 2**

This is an example of misleading information because the word “youth” suggests the man was young.
1 mark for a brief or muddled answer eg identifying the use of the word “youth” or “it refers to age”.
2 marks for some accurate elaboration eg the answer clearly states that the man was young or a youth or suggests that his age may influence the answer.
Credit answers which state that the information is misleading because the question suggests there was a youth in the picture, when in fact there was only a man and a woman.

(b) **AO3 = 1 mark + 3**

1 mark for independent (groups, measures, participants or subjects or between subjects or participants) design or unrelated design. 0 marks for individual.
1 mark for matched (groups, measures, participants, subjects).
A repeated measures design could not be used because participants would take part in both conditions. This would be inappropriate because their answer to one question would affect their answer to the other question. Candidates may point out this would make it easy to work out the aim of the experiment and so could lead to demand characteristics.
1 mark for a very brief / muddled answer eg “they couldn’t answer both questions.” “It could lead to demand characteristics.”
Further marks for accurate detail. “It could lead to demand characteristics because they would know what the experiment was about.” 2 marks
“Participants couldn’t take part in both conditions because their answer to one question would affect their answer to the other question.” 3 marks

(c) **AO3 = 4**

In this experiment it could be used to check how long the participant should be given to look at the picture so that the timing could be changed if it was too long or too short. It could check the participants understand the questions asked and what they are required to do. It could also be used to ask a few participants about their experience of taking part.

Credit any appropriate answer which could apply to this investigation. No marks are awarded for a definition of a pilot study. Explanations which do not relate to this investigation maximum 2 marks.

AO3 Application of knowledge of research methods
4 marks Accurate and reasonably detailed Accurate and reasonably detailed explanation that demonstrates sound understanding of why a pilot study would be appropriate in this study.
3 marks Less detailed but generally accurate Less detailed but generally accurate answer that demonstrates sound understanding of why a pilot study would be appropriate in this study.
2 marks Basic Basic answer that demonstrates some understanding of why a pilot study would be appropriate in this study, but lacks detail and may be muddled.
1 mark Very brief/flawed Very brief or flawed answer demonstrating very little understanding of why a pilot study would be appropriate in this study.
0 marks No creditworthy material.

(d) **AO3 = 4**

One strength of using photographs in the investigation would be control of variables eg the same pictures could be shown for the same amount of time. Candidates may refer to a limitation of the live conversation.
One limitation is lack of validity. The findings cannot be generalised to real life situations where other factors such as changing facial expressions and gestures could be relevant.
For each strength and limitation 1 mark for stating a strength / limitation. 2nd mark for accurate elaboration.

(e) **AO1 = 6**

Candidates must select a research study (studies) which relates to misleading information / leading questions, so research into weapon focus should not be credited.
Candidates are likely to refer to Loftus and Palmer's (1974) experiment where the verb in the critical question was changed (smashed, collided, bumped, hit or contacted.) Other relevant research would be Loftus and Palmer asking participants "Did you see any broken glass?" and Loftus et al's (1978) study using a red Datsun and Stop or Yield signs.
Research into anxiety and EWT is not relevant unless the candidate refers to misleading information such as Yuille and Cutshall where the witnesses to a real-life shooting appeared resistant to misleading information.
Research relating to age could also be relevant. Eg Warren et al (2005) found children were more likely to be influenced by misleading information than adults.
Credit any relevant research.

Examiners are reminded that there is a depth / breadth trade-off.

AO1 Knowledge and understanding
6 marks Accurate and reasonably detailed Accurate and reasonably detailed answer that demonstrates sound knowledge and understanding of the procedures and findings of one or more relevant research studies.
5 – 4 marks Less detailed but generally accurate Less detailed but generally accurate answer that demonstrates relevant knowledge and understanding of the procedures and findings of one or more relevant research studies.
3 – 2 marks Basic Basic answer that demonstrates some relevant knowledge and understanding of the procedures and findings of one or more relevant research studies but lacks detail and may be muddled.
1 mark Very brief/flawed Very brief or flawed answer demonstrating very little knowledge of the procedures and findings of one or more relevant research studies.
0 marks No creditworthy material.