24. Memory 1 MSM to Interference

Name: _____

Class: _____

Date: _____

Time: **91 minutes**

Marks: **70 marks**

Comments:

Q1.

Two groups of participants took part in a memory experiment. The researcher read 20 words to the participants.

- Participants in **Group A** had to write down the words immediately after they had heard them.
- Participants in **Group B** had to write down the words after they had read a book for one minute.

The researcher noticed that:

- participants in **Group A** generally recalled words from the beginning and the end of the list
- participants in **Group B** generally recalled words from the beginning of the list only.

Explain the results of this experiment with reference to the multi-store model of memory.

(Total 4 marks)

Q2.

Briefly outline **one** way in which researchers have investigated the capacity of short-term memory.

(Total 2 marks)

Q3.

Outline and evaluate research into duration in memory.

(Total 8 marks)

Q4.

Tick **two** of the boxes below to indicate which of the following are features of the working memory model.

A Serial position curve ☐

B Incidental learning store ☐

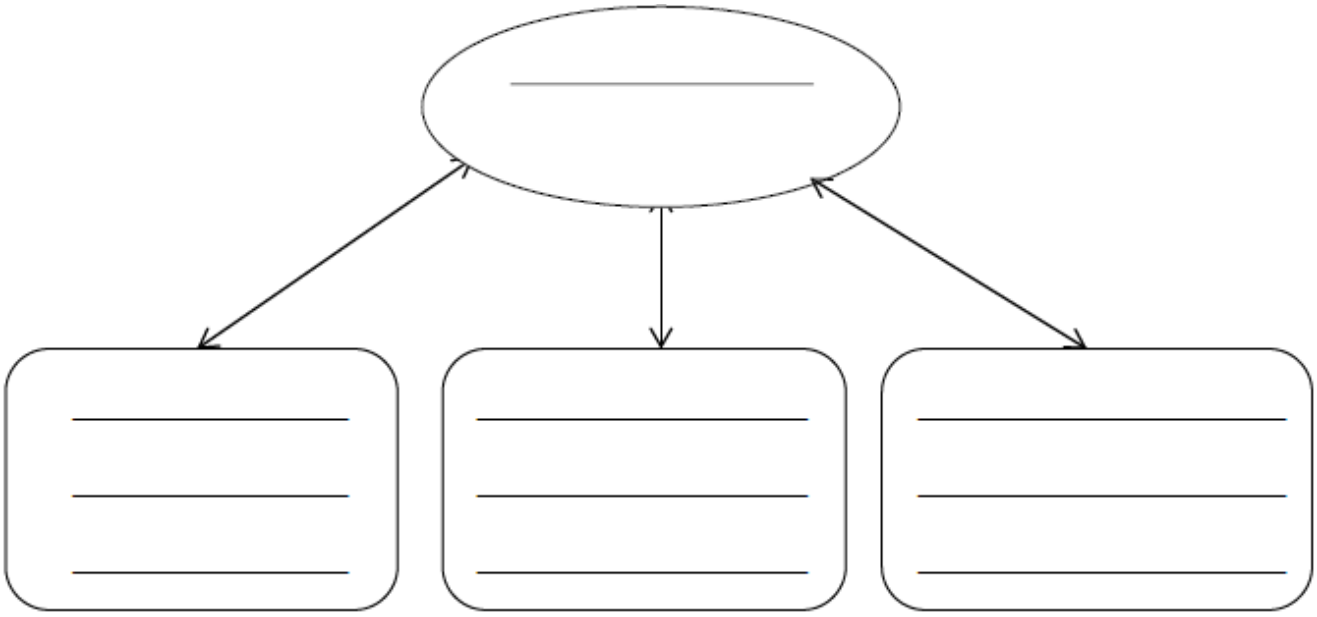
C Central executive ☐

D Phonological loop ☐

(Total 2 marks)

Q5.

Below is a diagram of the working memory model. Write the name of **each** of the **four** components of working memory in the space provided.



(Total 4 marks)

Q6.

Three components of the working memory model are the central executive, the phonological loop and the visuo-spatial sketchpad.

Briefly outline **each** of these components.

Central executive _____

_____

_____

_____

Phonological loop _____

_____

_____

_____

Visuo-spatial sketchpad _____

_____

_____

_____

(Total 6 marks)

Q7.

Suggest **one** way in which the working memory model might be a better explanation of short-term memory than the multi-store model.

_____

_____

(Total 1 mark)

Q8.

Discuss **one** strength of the working memory model.

(Total 4 marks)

Q9.

Explain **one** limitation of the working memory model.

(Total 3 marks)

Q10.

Claire can search through family photos on her laptop and listen to music at the same time. However, she finds it difficult to read her e-mails when talking to a friend on the phone.

Use your knowledge of the working memory model to explain why Claire is able to perform the first two tasks at the same time, but finds it difficult to perform the second two tasks at the same time.

(Total 4 marks)

Q11.

Which **one** of the following descriptions **best** describes semantic memory?

Shade **one** box only.

A A long-term store for knowledge of the world, not requiring conscious effort to recall.

B A long-term store for knowledge of the world, requiring conscious effort to recall.

C A long-term store for personal events, not requiring conscious effort to recall.

D A long-term store for personal events, requiring conscious effort to recall.

(Total 1 mark)

Q12.

Complete the following statement about long-term memory. Shade **one** box only.

Information not available for conscious inspection refers to:

A Episodic memory ⬭

B Procedural memory ⬭

C Semantic memory ⬭

(Total 1 mark)

Q13.

Which type of long-term memory would be most associated with the following?

Write the correct type of long-term memory in the spaces provided.

(a) Stored with reference to contextual information, eg time and place

_____

(1)

(b) Difficult to describe in words

_____

(1)

(c) Knowing the meaning of a word

_____

(1)

(Total 3 marks)

Q14.

Two types of long-term memory are procedural memory and episodic memory.

Explain **two** differences between procedural memory and episodic memory.

_____

_____

_____

_____

_____

_____

_____

_____

(Total 4 marks)

Q15.

Complete the following statement about long-term memory. Shade **one** box only.

Information stored with reference to time and place refers to:

A Episodic memory ⬭

B Procedural memory ⬭

C Semantic memory ⬭

(Total 1 mark)

Q16.

Sherry can remember her tenth birthday party when she was on holiday in France. During this holiday her father taught her how to swim. Although it took time for her to learn, she barely has to think about how to swim now. Sherry can also remember the French words for the food she ate while they were in France, even though she did not speak any French before the holiday.

With reference to Sherry's experiences, explain **three** different types of long-term memory.

(Total 6 marks)

Q17.

(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)

Q18.

Describe interference as an explanation for forgetting.

(Total 6 marks)

Q19.

Kaleb is learning about models of memory. Last week the teacher taught the class about the multi-store model. This week she is teaching the working memory model. Kaleb is now finding it difficult to recall any of the information about the multi-store model of memory.

Using your knowledge of interference as an explanation for forgetting, explain Kaleb's difficulty.

(Total 3 marks)

Q1.

[AO2 = 4]

Level	Marks	Description
2	3-4	The explanation of the results is clear and detailed with appropriate reference to the multi-store model. The answer is generally coherent with effective use of specialist terminology.
1	1-2	The explanation of the results is limited. The reference to the multi-store model is partial or includes inaccuracies. Terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

- in Group B, the disruption of the reading task prevented maintenance rehearsal
- in Group B, the reason the last few words are not available (recency effect) is because the duration of STM (18–30 secs) has been exceeded
- in Groups A and B, the first few words are rehearsed and transferred to long-term memory (primacy effect)
- in Groups A and B, the poor recall of words in the middle of the list is due to displacement from the later words/decay of earlier words in the list
- in Groups A and B, poor recall of words in the middle of the list is due to the limited capacity of STM (7+/-2)
- in Group A, due to immediate recall the last few words are still available in short-term memory (recency effect).

Note

- Naming of the primacy effect or the recency effect is not required for full marks.
- To gain full marks the response must address the results of both Group A and Group B.

[4]

Q2.

[AO1 = 2]

2 marks for a clear and coherent outline with some elaboration with reference to immediate (within 30 seconds) recall.

1 mark for a limited or muddled outline.

Possible content:

- participants are read a sequence of letters/numbers and asked to repeat the same sequence back **immediately**. An additional digit is added on each subsequent trial to measure the capacity of STM (the digit span technique).

Credit other possible ways.

Note that a wide range of answers is possible here – material presented to participants may vary, eg letters, numbers, words, different tones, etc.

Credit outline of studies that investigated the capacity of working memory components, and studies of chunking in STM. Accept relevant procedural details if embedded in findings.

Simply naming a way is not creditworthy.

[2]

Q3.

[AO1 = 3 AO3 = 5]

Level	Mark	Description
4	7-8	Knowledge of research into duration in memory is accurate and generally well detailed. Evaluation is thorough and effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear, coherent and focused. Specialist terminology is used effectively.
3	5-6	Knowledge of research into duration in memory is evident but there are occasional inaccuracies/omissions. Evaluation is mostly effective. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is used appropriately.
2	3-4	Limited knowledge of research into duration in memory is present. Focus is mainly on description. Any evaluation present is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1-2	Knowledge of research into duration in memory is very limited. Evaluation is 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.
	0	No relevant content.

Possible content

- knowledge of procedures and/or findings/conclusions of studies which investigate duration of sensory memory, STM or LTM, eg Peterson and Peterson - Trigrams study (1959), Bahrick - Yearbook study (1974).

Accept other valid studies of duration in memory.

Note: That the term 'research' may include theories/explanations and/or studies.

Possible evaluation:

- use of artificial material, eg recall of trigrams, lists of unconnected words etc
- use of artificial laboratory setting
- discussion of issues of validity (higher in Bahrick study), reliability
- alternative explanations – Peterson and Peterson's findings may be more to do with interference than duration.

Note that one study is sufficient for full marks.

[8]

Q4.

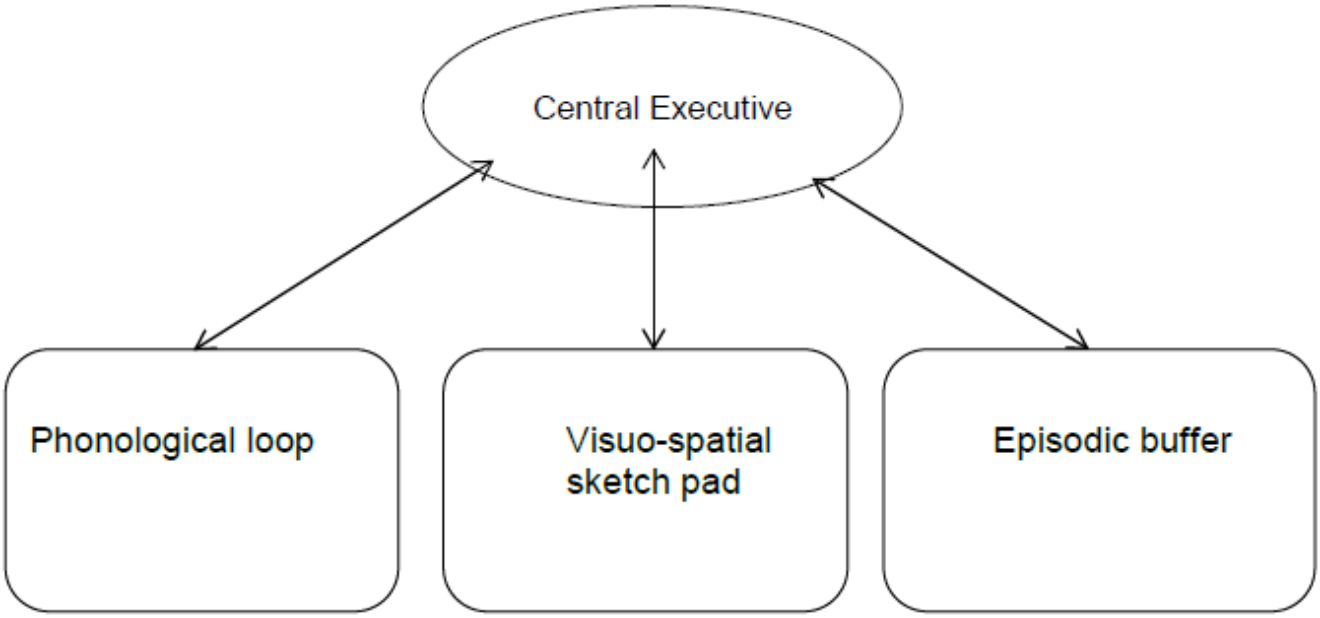
AO1 = 2

C and D are features of the WMM. A and B are not.
1 mark for each correct answer. If more than 2 boxes are ticked, 0 marks.

Q5.

[A01 = 4]

1 mark for naming each component correctly. The central executive will need to be in the correct position (top box) but the other three components can appear in any of the remaining boxes.



Accept also ‘phonological store’ and 'visuo-spatial scratchpad' as alternatives.

Q6.

AO1 = 6

The central executive has a supervisory function and controls the slave systems. It has limited capacity but can process information from any sensory modality.

The phonological loop is a limited capacity, temporary storage system for holding verbal information in a speech based form.

The visuo-spatial sketchpad is a limited capacity, temporary memory system for holding visual and spatial information.

In each case 1 mark for a brief answer eg the visuo-spatial sketchpad holds visual

and spatial information. 2nd mark for accurate elaboration or an example of how it might be used.

Within each component award a maximum of 1 mark for simply naming 1 or more parts eg phonological store (inner ear), articulatory process (inner voice) in the phonological loop, or inner scribe, visual cache in the visuo-spatial sketchpad.

Q7.

[AO3 = 1]

1 mark for a brief suggestion of why the WMM offers a better explanation.

Possible content:

- it is not a unitary store
- range of research support, e.g. dual task studies, brain scanning studies
- the WMM explains STM as a more active process than the MSM.

Credit other valid points.

[1]

Q8.

[AO3 = 4]

Level	Mark	Description
2	3-4	Discussion of strength is clear and coherent. For 3 marks, some detail / expansion may be lacking. Specialist terminology is used appropriately.
1	1-2	Discussion of strength is limited/muddled or briefly stated / outlined only. Specialist terminology may be used inappropriately or is absent.
	0	No relevant content.

Possible strengths:

- evidence supports the existence of separate stores in STM, e.g. KF; brain scanning evidence, e.g. Paulesu; dual-task performance, e.g. Baddeley et al. Evidence may be used to support general principles of model or specific stores / sub-components
- suggests STM is an active processor rather than the unitary 'stopping-off station' version presented by the multi-store model
- practical application, e.g. phonological deficits observed in dyslexia linked to articulatory loop.

Credit counterargument as part of the discussion, e.g. supporting studies tend to involve artificial tasks.

Accept other valid strengths.

If more than one strength is presented, all should be marked and the best one credited.

[4]

Q9.

[AO3 = 3]

3 marks for a clear, coherent and detailed explanation of a limitation, using appropriate terminology.

2 marks for a less detailed explanation of a limitation using some of the detail given below.

1 mark for a muddled or limited explanation of a limitation.

Possible limitations:

- vague, untestable nature of the central executive or episodic buffer
- evidence suggesting the central executive is not unitary, eg EVR had good reasoning skills but was poor at decision-making
- evidence that visuo-spatial scratch pad is not unitary and divided into inner scribe and visual cache
- supported by highly controlled lab studies which may undermine the validity of the model
- doesn't account for musical memory because it's possible to listen to instrumental music without impairing performance on other auditory tasks.

Credit other relevant limitations.

[3]

Q10.

[AO1 = 2, AO2= 2]

AO1

Award up to two marks for relevant knowledge of the working memory model. Credit knowledge / identification of each store / sub-systems (not episodic buffer); the idea that two tasks using separate stores can be performed simultaneously; performing two tasks that involve the same store impairs performance.
Credit reference to limited capacity.
Credit reference to the allocation of tasks by the central executive.

Students may gain both marks by referring to specific stores or more general, relevant features of the model.

AO2

Up to two marks for application to the scenario.

For full credit answers must refer to both sets of tasks.

Possible answer: Claire is able to search for photos and listen to music as these tasks involve different sub-systems in working memory (1) – the visuo-spatial sketch / scratch pad and the articulatory / phonological loop / store / primary acoustic store (1). Claire finds it difficult to read her e-mails and talk on the phone as these tasks involve the same store (1) – the articulatory / phonological loop / store / primary acoustic store (1).

Q11.

[AO1 = 1]

B

[1]

Q12.

[AO1 = 1]

B

Q13.

[AO1 = 1]

Episodic

1

[AO1 = 1]

Procedural

1

[AO1 = 1]

Semantic

1

[3]

Q14.

[AO3 = 4]

Level	Marks	Description
2	3 – 4	Explanation of two differences is clear and coherent. Some detail/expansion may be lacking for 3 marks.
1	1 – 2	Explanation of one or more differences is present but is briefly stated/outlined only. Alternatively, there is one clearly explained difference at the top of the band. For 1 mark one difference may be stated but not applied to both types of memory.
	0	No relevant content.

Possible differences:

- procedural memories are memories of motor skills/actions/muscle memories; episodic memories are memories of life events
- procedural memories are unavailable for conscious inspection/difficult to explain verbally (non-declarative); episodic memories can be expressed verbally (declarative)
- procedural memories may be more resistant to forgetting/amnesia
- each type of memory may reside in a different area of the brain
- credit examples/evidence, eg HM, used to explain a difference.

Credit other relevant differences.

Q15.

[AO1 = 1]

A

Q16.

[AO2 = 6]

For **each** type of long-term memory award marks as follows:

2 marks for a clear and coherent application of a type of long-term memory with elaboration.

1 mark for a muddled/limited application.

Possible application:

- Sherry remembering her tenth birthday party/when she was on holiday in France are examples of episodic memory because she recalls the events that took place at a specific point in time
- Sherry remembering how to swim is an example of procedural memory because she is remembering an automatic action/muscle-based memory
- Sherry recalling the French words (for the food she ate) is an example of semantic memory because it involves remembering factual/meaningful information.

[6]

Q17.

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).

Q18.

[AO1 = 6]

Level	Marks	Description
3	5 – 6	Knowledge of retroactive and proactive interference as explanations for forgetting is clear and generally well detailed. The answer is generally coherent with appropriate use of terminology.
2	3 – 4	Knowledge of interference as an explanation for forgetting is evident. The answer lacks clarity in places. Terminology is used appropriately on occasions.
1	1 – 2	Knowledge of interference as an explanation for forgetting is limited. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
	0	No relevant content.

Content:

- Interference where two lots of information become confused in memory
- Proactive interference is where old learning affects recall of new information
- Retroactive interference is where new learning affects recall of old information
- Newer information may overwrite earlier information
- Interference occurs more when the two lots of information are similar
- Interference is less likely to occur when there is a gap between the instances of learning

Credit other relevant information.

Q19.

[AO2 = 3]

3 marks for a clear, coherent and detailed explanation of why Kaleb is having difficulty recalling the multi-store model.
2 marks for a less detailed explanation using some of the detail given below.
1 mark for a muddled or limited explanation.

Possible content:

- retroactive interference is occurring
- the newer learning of the working memory model (WMM) is affecting recall of the older information about the multi-store model (MSM)
- information about the WMM may have overwritten the earlier information about the MSM
- interference is more likely to occur because both topics were similar/models of memory
- there may not have been much time between learning the two models and so they have become confused/forgetting of the first model (MSM) is greater.

Credit other relevant material.

[3]