Mark schemes

**Q1.**

**[AO1 = 6 AO2 = 4 AO3 = 6]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 4 | 13-16 | Knowledge of the working memory model is accurate and generally well detailed. Application is effective. Discussion 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 | 9-12 | Knowledge of the working memory model is evident but there are occasional inaccuracies/omissions. Application and/or discussion is mostly effective. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is used appropriately. |
| 2 | 5-8 | Limited knowledge of the working memory model is present. Focus is mainly on description. Any discussion and/or application is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. |
| 1 | 1-4 | Knowledge of the working memory model is very limited. Discussion and/or application 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:**

•   version of STM which sees this store as an active processor

•   description of central executive and sub-systems/components – visuo-spatial scratch/sketch pad (visual cache, inner scribe); phonological store/loop; articulatory loop/control process; primary acoustic store; episodic buffer (versions vary – not all sub-systems need to be present for full marks)

•   information concerning capacity and coding of each store

•   allocation of resources/divided attention/dual-task performance.

**Possible application:**

•   in the early part of the conversation, Rory/the central executive can divide attention between the conversation and the game on his phone

•   this is because the two tasks use different sub-systems: phonological store/articulatory loop for the conversation and VSSP for the game

•   when he is asked to recount his route to school (a visuo-spatial task), this places too many demands on the VSSP

•   this means Rory must abandon his game to free up more attentional resources because of the limited capacity of the stores.

**Possible discussion:**

•   use of evidence to support or refute the model/individual sub-systems, eg Hunt – central executive; KF case study – separate visual and verbal stores in STM; Paulescu et al – PET scan; Logie – mental rotation task for VSSP

•   explains how cognitive processes interact

•   a view of memory that is active rather than passive (in contrast to the multi-store model)

•   provides explanation/treatments for processing deficits, eg dyslexia

•   explains results of dual task studies, eg Baddeley

•   vague, untestable nature of the central executive

•   supported by highly controlled lab studies which may undermine the validity of the model.

Credit other relevant material.

**[16]**

**Q2.**

(a)     **AO2 = 4**

The visuo-spatial scratchpad (sketchpad) stores / manipulates visual and spatial information and will be active when the person is doing a visual task. The phonological loop, comprising the phonological store (inner ear) and articulatory control system (inner voice) will be active during a verbal task.

1 mark for accurate identification of at least two components, eg central executive, visuo-spatial sketchpad / scratchpad and phonological loop (or a sub-component). Credit an accurate diagram.  
1 mark for a very brief or muddled explanation.  
Up to 2 further marks for an accurate explanation.

(b)     **AO2 = 2**

Likely examples for a verbal task include learning / repeating words, speaking and reading.  
Visual tasks include forming an image of something and answering questions about it or mentally counting the windows of a house, watching DVD, reading.

Credit any acceptable tasks which are clearly verbal or visual.

To be appropriate in this context, the verbal and visual tasks must be different. However, some tasks, eg reading, could be verbal or visual.

**Q3.**

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**

Candidates may refer to the original 1974 version of the model, later additions, or may include the episodic buffer which was added in 2000.  
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.  
Likely weaknesses 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. Simply stating the model does not explain LTM is not credit-worthy as a weakness. However, stating that the link between WM and LTM is not fully explained is legitimate.  
Credit any acceptable strength and weakness.  
For each strength and weakness, 1 mark for identification. A further mark for accurate elaboration.  
For example, 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).

**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.**

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 = 2**

Likely limitations include: little is known about how the central executive works; evidence from brain studies suggesting the central executive is not unitary; it fails to account for musical memory because we are able to listen to instrumental music without impairing performance on other acoustic tasks.

Simply stating the model does not explain LTM is not credit-worthy. However stating the link between WM and LTM is not fully explained is legitimate.

Stating the model is too simple (with no accurate elaboration) is not credit-worthy.

1 mark for identification eg the central executive is too simplistic. A further mark for accurate elaboration.

**Q6.**

**Marks for this question: AO1 = 6, AO3 = 6**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 4 | 10 – 12 | Knowledge is accurate and generally well detailed.  Discussion / evaluation / application is effective. The answer is clear, coherent.  Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking. |
| 3 | 7 – 9 | Knowledge is evident. There are occasional inaccuracies. There is some effective discussion / evaluation / application. The answer is mostly clear and organised.  Specialist terminology is mostly used appropriately. |
| 2 | 4 – 6 | Knowledge is present. Focus is mainly on description. Any discussion / evaluation / application is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. |
| 1 | 1 – 3 | Knowledge is limited. Discussion / evaluation / application 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. |

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

**AO1**

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.   
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.   
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuospatial sketch pad or scratchpad.   
Candidates should refer to components and processes.   
Candidates may be credited for a diagram but description of the mechanisms involved should also be present.

**AO3**

Candidates are likely to evaluate the WMM in terms of its strengths and weaknesses.   
Likely strengths include use of 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.   
Likely weaknesses 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. Stating that WM focuses too much on STM and not on LTM is not creditworthy, although suggesting it isn’t a complete model of memory could be.   
Genuine comparison / contrast with alternative models of memory is creditworthy, but description eg of MSM is not.

**Q7.**

**Marks for this question: AO1 = 6, AO3 = 10**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 4 | 13 – 16 | Knowledge is accurate and generally well detailed. Discussion / evaluation / application is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking. |
| 3 | 9 – 12 | Knowledge is evident. There are occasional inaccuracies. Discussion / evaluation / application is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places. |
| 2 | 5 – 8 | Some knowledge is present. Focus is mainly on description. Any Discussion / evaluation / application is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. |
| 1 | 1 – 4 | Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used. |
|  | 0 | No relevant content. |

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

**AO1**

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.   
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.   
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuospatial sketch pad or scratchpad.   
Candidates should refer to components and processes.   
Candidates may be credited for a diagram but description of the mechanisms involved should also be present.

**AO3**

Candidates are likely to evaluate the WMM in terms of its strengths and weaknesses. Likely strengths include use of 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.   
Likely weaknesses 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. Stating that WM focuses too much on STM and not on LTM is not creditworthy, although suggesting it isn’t a complete model of memory could be.   
Genuine comparison / contrast with alternative models of memory is creditworthy, but description eg of MSM is not.

**Q8.**

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.

**AO1 = 4**

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer.

The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.

Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.

For 4 marks candidates should refer to components and the relationship between them eg central executive as a control system of slaves.

Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

|  |
| --- |
| **AO1  Knowledge of the working memory model** |
| **4 marks  Accurate and reasonably detailed** Accurate and reasonably detailed answer that demonstrates sound knowledge of the model. |
| **3 marks  Less detailed but generally accurate** Less detailed but generally accurate answer that demonstrates relevant knowledge of the model. |
| **2 marks  Basic** Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled. |
| **1 mark  Very brief / flawed** Very brief or flawed answer demonstrating very little knowledge of the model eg simply naming one or more components. |
| **0 marks** No creditworthy material |

**Q9.**

**[AO1 = 2]**

Up to 2 marks for a description of the procedure / method. Typically a full answer will include the two conditions of the study.  
  
Possible answers:   
In one study, participants in Condition 1 were asked to memorise a series of letters while participants in Condition 2 were asked to rehearse the sounds of the letters in their heads. All the participants had their blood flow in their brains measured by PET scan while doing the tasks.   
In a study, participants in one condition were asked to play a computer game using a joystick while carrying out a visuospatial distracter task. In the other condition participants played the same game but they had to carry out a verbal memory distracter task.

**Q10.**

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.

**[AO1 = 1, AO2 = 2]**

**AO1**

One mark for one strength of the working memory model. Likely points: the model helps to explain how cognitive processes interact / memory is an active rather than passive process / it provides explanation and possible treatment programmes for people with processing deficits / it highlights the different memory tasks that STM can deal with by identifying separate components. Can explain the results of dual task studies.

**AO2**

Up to 2 marks for an explanation of how / why the issue chosen is a strength. Credit comparison with other models.   
Credit use of evidence as part of the explanation.

**Q11.**

**[AO1 = 2]**

Up to 2 marks for an outline of two features of the working memory model.   
Central executive – oversees the activity of the subsystems, an attentional system, retrieves information from LTM.   
Articulatory loop / articulatory control process / articulatory rehearsal process – is a verbal rehearsal system / inner voice.   
Primary acoustic store / phonological store – is a sound-based system / inner ear. (these may be subsumed under Phonological loop – the sound system)   
Visuospatial scratch / sketch pad – where visual and spatial information is imaged and manipulated / inner eye.   
Episodic buffer – where information from each subsystem can inter-connect.   
Allow broader features of the model including parallel processing, limited capacity, active processing in STM.   
Maximum of 1 mark for only naming two components.

**Q12.**

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).

**Q13.**

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.

**AO1 = 4**

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.  
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.  
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.  
For 4 marks candidates should refer to components and the relationship between them. Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

|  |
| --- |
| **AO1  Knowledge of the working memory model** |
| **4 marks  Accurate and reasonably detailed** Accurate and reasonably detailed answer that demonstrates sound knowledge of the model.There is appropriate selection of material to address the question. |
| **3 marks  Less detailed but generally accurate** Generally accurate but less detailed answer that demonstrates relevant knowledge of the model.There is some evidence of selection of material to address the question. |
| **2 marks  Basic** Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled. There is little evidence of selection of material to address the question. |
| **1 mark  Very brief and/or flawed** Very brief or flawed answer that demonstrates very little knowledge of the model. Selection of material is largely inappropriate. |
| **0 marks** No creditworthy material. |

**Q14.**

**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.

**Q15.**

**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.

**Q16.**

**[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).

**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.

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.

**AO1 = 4**

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.  
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.  
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.  
For 4 marks candidates should refer to components and processes.  
Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

|  |
| --- |
| **AO1    Knowledge of the working memory model** |
| **4 marks Accurate and reasonably detailed** Accurate and reasonably detailed answer that demonstrates sound knowledge of the model. |
| **3 marks Less detailed but generally accurate** Less detailed but generally accurate answer that demonstrates relevant knowledge of the model. |
| **2 marks Basic** Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled. |
| **1 mark Very brief / flawed** Very brief (e.g. only naming 2 or more components), or flawed answer demonstrating very little knowledge of the model. |
| **0 marks** No creditworthy material. |

**Q18.**

**[AO2 = 4]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 2 | 3 – 4 | Knowledge of relevant features of the working memory model is clear and accurate. The application of these to the scenario is effective. At the top of the band there must be reference to both characters in the stem. Specialist terminology is used effectively. |
| 1 | 1 – 2 | Knowledge of relevant features of the working memory model lacks clarity/accuracy/detail. Application may be limited or absent. Specialist terminology is not always used effectively. |
|  | 0 | No relevant content. |

**Possible content:**

•        Reference to attentional capacity/capacity of the central executive – because driving is an ‘automated’ task for Bryan, it makes fewer attentional demands on his central executive so he is free to perform other tasks (such as talking or listening to music); this is not the case for Bob who requires all of his attentional capacity for driving.

•        Credit reference to Bob’s inability to dual-task and to divide resources effectively between components of working memory.

•        Credit the idea that Bryan is able to divide resources between his visuo-spatial scratch / sketch pad (driving) and articulatory control process / articulatory / phonological loop / primary acoustic store (talking and listening to music) and thus to dual-task.

Accept other valid applications of the model.

**Q19.**

**[AO1 = 6 AO3 = 10]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 4 | 13 – 16 | Knowledge of components and functioning of model is accurate and generally well detailed. Evaluation is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking. |
| 3 | 9 – 12 | Knowledge of components of model is evident and there is some reference to function of model. There are occasional inaccuracies. Evaluation is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology mostly used effectively. Lacks focus in places. |
| 2 | 5 – 8 | Knowledge of some components of model is present. Focus is mainly on description. Any evaluation is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology used inappropriately on occasions. |
| 1 | 1 – 4 | Knowledge of model is limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used. |
|  | 0 | No relevant content. |

**AO1 Content:**

•        version of STM which sees this store as an active processor

•        description of central executive and ‘slave systems’ – visuo-spatial scratch / sketch pad; phonological store / loop; articulatory loop / control process; primary acoustic store; episodic buffer (versions vary – not all of slave systems need to be present for full marks)

•        information concerning capacity and coding of each store

•        allocation of resources / divided attention / dual-task performance.

**AO3 Possible evaluation points:**

•        strengths include: explains how cognitive processes interact; memory is active rather than passive; provides explanation / treatments for processing deficits; highlights different memory tasks that STM can deal with by identifying separate components; explains results of dual task studies

•        limitations include: vague, untestable nature of the central executive; supported by highly controlled lab studies which may undermine the validity of the model

•        use of evidence to support or refute the model

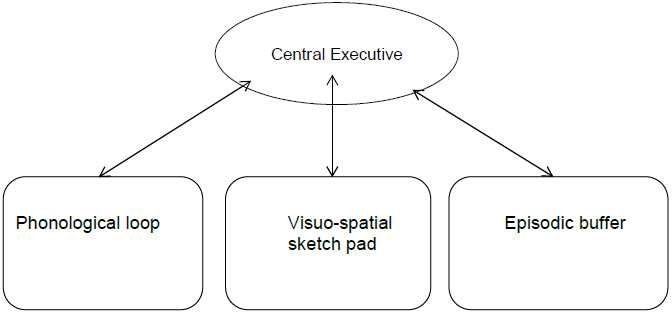
•        credit other relevant evaluative points.

Only credit evaluation of the methodology used in studies when made relevant to discussion of the model.

**Q20.**

**[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.

**Q21.**

**[AO1 = 6 AO3 = 6]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 4 | 10 – 12 | Knowledge of what psychological research (theory and/or evidence) has shown about working memory is accurate and generally well detailed. Discussion is effective. The answer is clear and coherent. Minor detail and/or expansion is sometimes lacking. Specialist terminology is used effectively. |
| 3 | 7 – 9 | Knowledge of what psychological research (theory and/or evidence) has shown about working memory is evident but there are occasional inaccuracies/omissions. There is some effective discussion. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately. |
| 2 | 4 – 6 | Limited knowledge of what psychological research (theory and/or evidence) has shown about working memory is present. Focus is mainly on description. Any discussion is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. |
| 1 | 1 – 3 | Knowledge of what psychological research (theory and/or evidence) has shown about working memory is very limited. Discussion 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. |

**Content:**

Full credit can be gained for theory and/or evidence.

•        The working memory model proposed by Baddeley and Hitch in 1970s as an updated version of STM

•        WM is understood as an active processor

•        The components and their functions and properties; central executive; phonological loop/store (articulatory and acoustic processing); visuo-spatial scratchpad/sketchpad; episodic buffer. Credit diagram

•        Description of what research evidence has shown/findings of studies/conclusions in relation to working memory in general or the different components including:

•        Concurrent/dual task studies

•        Articulatory suppression studies

•        Brain imaging research showing different areas of the brain are active when performing different types of task

•        Clinical evidence of selective impairments to STM

**Possible discussion points:**

•        Explains how different cognitive processes interact

•        Comparison with passive view of STM in the MSM

•        Use of evidence to support or contradict the concept of working memory

•        Discussion/evaluation of working memory research eg issues of validity in dual task research/scanning studies where tasks might be seen as unrealistic/artificial; sampling issues and generalisation

•        Problem of testing/fully explaining the central executive

•        Applications eg explains processing deficits like reading difficulties and offers possible routes to therapy

Credit other relevant material.

Note – ethical issues in relation to studies would not normally be relevant as they do not affect the understanding of working memory.

**Q22.**

**[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]**

**Q23.**

**[AO1 = 6]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Mark** | **Description** |
| 3 | 5-6 | Knowledge of the cognitive interview is accurate and generally well detailed. The answer is clear and coherent. Specialist terminology is used effectively |
| 2 | 3-4 | Some knowledge of the cognitive interview is present but there may be some detail missing / lack of clarity. There is some appropriate use of specialist terminology. |
| 1 | 1-2 | Limited knowledge of the cognitive interview. The answer as a whole lacks clarity / accuracy. Specialist terminology is either absent or inappropriately used. |
|  | 0 | No relevant content. |

**Possible content:**

Knowledge of the cognitive interview.

•   reinstating the context – interviewee mentally reinstates the environmental and personal context of the incident, e.g. sights, sounds, weather etc; (based on the principle of retrieval failure / cue-dependent forgetting that cues may trigger recall)

•   report everything – interviewer encourages the reporting of every single detail of the event, even though it may seem irrelevant; (such detail may trigger other memories)

•   changing order – interviewer tries alternative ways through the timeline of the incident; (reduces possibility that recall may be influenced by schema / expectations)

•   changing perspective – interviewee recalls from different perspectives, e.g. how it would have appeared to other witnesses; (reduces influence of schema)

•   features of enhanced cognitive interview to facilitate recall – focus on social interaction, reducing anxiety / distractions, slow speech, use of open-ended questions.

Simply listing aspects of the cognitive interview, maximum 2 marks.

**[6]**

**Q24.**

(a)    **[AO2 = 2]**

**1 mark** for each:

Mentally counting backwards from 100 – Articulatory loop or store; phonological loop or store; articulatory control processes.

Tracking coloured shapes on a computer screen – Visuo-spatial scratchpad / sketchpad / Inner scribe / Visual cache.

Accept central executive / episodic buffer for either component, but not the same answer for both.

If more than one component is named for either task, only the first should be marked.

**2**

(b)    **[AO3 = 4]**

For each way:

**2 marks** for a clear and coherent way

**1 mark** for a limited / muddled way

**0 marks** for simply stating a way

**Possible improvements: how the experiment could be improved (this might include why this would be an improvement).**

•   improving the sample / sampling method / target population – details of alternative method, e.g. stratified

•   changing the design – use of an alternative design (repeated measures, matched pairs) and brief details of how this would be implemented

•   changing the nature of the tasks – suggestions for tasks that are more reflective of real-life behaviour, e.g. reading e-mails whilst talking on the phone, etc

•   changing the type of experiment – suggestions for alternative, e.g. field study – carry out the research in a more natural setting, e.g. an office environment or a classroom

•   participants should be randomly allocated to each experimental condition; brief explanation of how this would be done.

Credit other valid improvements.

**4**

**[6]**

**Q25.**

**[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]**

**Q26.**

**[AO1 = 4]**

For **each** component:

**1 mark** for name of component.

**1 mark** for brief outline of component.

**Possible content**:

•   visuo-spatial sketch/scratch pad – temporary storage of visual and spatial information; inner eye; visual coding; can hold 3–4 items; visual cache, visual scribe

•   phonological store/loop/articulatory loop/control process/primary acoustic store – limited capacity temporary storage system; holds acoustic information according to tone, volume, pitch, etc; inner ear; verbal rehearsal loop, sub-vocal speech; duration 1.5–2 secs; inner voice

•   episodic buffer – integrates/synthesises information from other stores; link to LTM; modality free.

Credit components as identified/offered by the candidate whether global components or sub-components (eg visual cache).

**[4]**

**Q27.**

**[AO3 = 4]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Mark** | **Description** |
| 2 | 3-4 | The evaluation of the central executive is clear and detailed. The answer is generally coherent with effective use of specialist terminology. |
| 1 | 1-2 | The evaluation of the central executive is limited or muddled. Specialist terminology is not always used appropriately or is absent. |
|  | 0 | No relevant content. |

**Possible evaluation**:

•   Central executive is vague and untestable (despite being the component in overall charge)

•   Central executive itself may be divided into separate sub-components

•   links with attention research – allocation of resources/divided attention/dual-tasking

•   use of evidence to support or contradict the central executive, eg Hunt (1980).

Accept other relevant points.

**[4]**

**Q28.**

**[AO1 = 4]**

|  |  |  |
| --- | --- | --- |
| **Level** | **Mark** | **Description** |
| 2 | 3-4 | Description of the working memory model is clear and has some detail. The answer is generally coherent with effective use of terminology. |
| 1 | 1-2 | Description of the working memory model is evident but lacks clarity and/or detail. The answer as a whole is not clearly expressed. Terminology is either absent or inappropriately used. |
|  | 0 | No relevant content. |

**Possible content:**

•   a model of STM which sees this store as non-unitary and an active processor

•   description of central executive and ‘slave systems’ – visuo-spatial scratch/sketch pad; phonological store/loop; articulatory loop/control process; phonological store; episodic buffer (versions vary – not all of slave systems need to be present for full marks)

•   information concerning capacity and coding of each store

•   allocation of resources/divided attention/dual-task performance.

Students may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full **4 marks**.

**[4]**

**Q29.**

**[AO1 = 3]**

**3 marks** for a clear and coherent description of the phonological loop.

**2 marks** for a less detailed description of the phonological loop.

**1 mark** for a muddled or limited description.

**Possible content:**

•   one of the slave systems controlled by the central executive

•   deals with auditory / sound information or deals with both written and spoken material

•   can be subdivided into the phonological store (inner ear) and the articulatory process (inner voice)

•   the phonological store stores the words you hear (in speech form)

•   the articulatory process allows for maintenance rehearsal

•   has a limited capacity / the capacity of the loop is what can be said in 2 seconds.

Credit other valid points.

**[3]**

**Q30.**

**[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]**