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# INTERNATIONAL AS PSYCHOLOGY PS02

Unit 2 Biopsychology, Development and Research Methods 1

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Mark scheme

January 2023

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Version 1.0 Final



2 3 1 X P S 0 2 / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from [oxfordaqaexams.org.uk](http://oxfordaqaexams.org.uk)

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## Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

### Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

### Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

**Section A: Biopsychology**

**Total for this section: 30 marks**

Question	Marking guidance	Total marks
01	<p><b>Below are four statements about neurotransmitters. Identify the one statement that is incorrect. Shade one box only.</b></p> <p><b>Correct answer: B</b></p>	<p><b>1</b></p> <p><b>AO1 = 1</b></p>

Question	Marking guidance	Total marks
02	<p><b>Localisation of function in the brain suggests specific brain areas are specialised for certain functions.</b></p> <p><b>Briefly describe the function of the somatosensory cortex.</b></p> <p><b>2 marks</b> for a clear description of the function of the somatosensory cortex.</p> <p><b>1 mark</b> for a limited/vague/muddled description of the function of the somatosensory cortex.</p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Receives and processes sensations from receptors in the skin positioned in all areas of the body.</li> <li>• Responsible for interpreting touch, pain, temperature, pressure.</li> </ul> <p>Credit other relevant content.</p>	<p><b>2</b></p> <p><b>AO1 = 2</b></p>

Question	Marking guidance	Total marks						
03	<p><b>Outline possible effects of damage to Broca’s area.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Unable to produce speech.</li> <li>• Broca’s aphasia or expressive aphasia.</li> <li>• Speech may be slow and laboured.</li> <li>• Loss of normal grammatical structure, eg loss of linking words and prepositions.</li> <li>• Might only produce specific words or invent words.</li> </ul> <p>Credit other relevant material.</p> <table border="1" data-bbox="284 1832 1321 2022"> <thead> <tr> <th>Level</th> <th>Description</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td><b>3</b></td> <td>Outline of possible effects of damage to Broca’s area is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.</td> <td><b>3</b></td> </tr> </tbody> </table>	Level	Description	Marks	<b>3</b>	Outline of possible effects of damage to Broca’s area is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.	<b>3</b>	<p><b>3</b></p> <p><b>AO1 = 3</b></p>
Level	Description	Marks						
<b>3</b>	Outline of possible effects of damage to Broca’s area is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.	<b>3</b>						

	<b>2</b>	Outline of possible effects of damage to Broca’s area is relevant but detail is lacking. The answer lacks clarity in places.	<b>2</b>
	<b>1</b>	Outline of possible effects of damage to Broca’s area is very limited. The answer is vague/muddled.	<b>1</b>
	<b>0</b>	No creditable content.	<b>0</b>

<b>Question</b>	<b>Marking guidance</b>	<b>Total marks</b>															
<b>04</b>	<p><b>Describe the function of the endocrine system.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• The main function is to control or regulate the activity of particular cells or organs (internal physiological regulations).</li> <li>• Glands secrete hormones directly into the bloodstream.</li> <li>• Hormones released by these glands are vital to most of the physiological functions of the body.</li> <li>• The hypothalamus controls the endocrine system through the pituitary gland.</li> <li>• The pituitary gland controls other endocrine glands.</li> </ul> <p>Credit examples of function of glands and their associated hormones. Credit reference to the fight or flight response if linked to the endocrine system. Credit other relevant material.</p> <table border="1"> <thead> <tr> <th><b>Level</b></th> <th><b>Description</b></th> <th><b>Marks</b></th> </tr> </thead> <tbody> <tr> <td><b>3</b></td> <td>Description of the function of the endocrine system is detailed and accurate. The answer is clear with appropriate use of specialist terminology.</td> <td><b>5–6</b></td> </tr> <tr> <td><b>2</b></td> <td>Description of the function of the endocrine system is relevant but detail is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology.</td> <td><b>3–4</b></td> </tr> <tr> <td><b>1</b></td> <td>Description of the function of the endocrine system is very limited. The answer is vague/muddled. Specialist terminology is either absent or inappropriately used.</td> <td><b>1–2</b></td> </tr> <tr> <td><b>0</b></td> <td>No creditable content.</td> <td><b>0</b></td> </tr> </tbody> </table>	<b>Level</b>	<b>Description</b>	<b>Marks</b>	<b>3</b>	Description of the function of the endocrine system is detailed and accurate. The answer is clear with appropriate use of specialist terminology.	<b>5–6</b>	<b>2</b>	Description of the function of the endocrine system is relevant but detail is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology.	<b>3–4</b>	<b>1</b>	Description of the function of the endocrine system is very limited. The answer is vague/muddled. Specialist terminology is either absent or inappropriately used.	<b>1–2</b>	<b>0</b>	No creditable content.	<b>0</b>	<p><b>6</b></p> <p><b>AO1 = 6</b></p>
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<b>3</b>	Description of the function of the endocrine system is detailed and accurate. The answer is clear with appropriate use of specialist terminology.	<b>5–6</b>															
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<b>0</b>	No creditable content.	<b>0</b>															

Question	Marking guidance	Total marks															
05	<p><b>Pavel is cooking dinner. He picks up a pan from the cooker. When he touches the hot handle, Pavel drops the pan.</b></p> <p><b>Explain how sensory neurons, relay neurons and motor neurons would function in this situation.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Sensory neurons:receptors in Pavel’s fingers would sense the heat from the handle of the pan and send that information via the PNS to the brain/CNS.</li> <li>• Relay neurons would be involved in analysing the sensation of heat and pain, and are involved in deciding to let go of the pan.</li> <li>• The message from the brain instructs the motor neurons so that Pavel’s fingers let go of the pan and therefore he drops the pan.</li> </ul> <p>Credit other relevant application.</p> <table border="1" data-bbox="284 875 1318 1469"> <thead> <tr> <th>Level</th> <th>Description</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>Explanation of the function of the three types of neurons is detailed and application to Pavel is appropriate. The answer is clear with appropriate use of specialist terminology.</td> <td>5–6</td> </tr> <tr> <td>2</td> <td>Explanation of function of at least two types of neurons is relevant but detail/ application to Pavel is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology.</td> <td>3–4</td> </tr> <tr> <td>1</td> <td>Explanation of the function of neurons is very limited. The answer is vague/muddled. Specialist terminology is either absent or inappropriately used.</td> <td>1–2</td> </tr> <tr> <td>0</td> <td>No creditable content.</td> <td>0</td> </tr> </tbody> </table>	Level	Description	Marks	3	Explanation of the function of the three types of neurons is detailed and application to Pavel is appropriate. The answer is clear with appropriate use of specialist terminology.	5–6	2	Explanation of function of at least two types of neurons is relevant but detail/ application to Pavel is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology.	3–4	1	Explanation of the function of neurons is very limited. The answer is vague/muddled. Specialist terminology is either absent or inappropriately used.	1–2	0	No creditable content.	0	<p><b>6</b></p> <p><b>AO2 = 6</b></p>
Level	Description	Marks															
3	Explanation of the function of the three types of neurons is detailed and application to Pavel is appropriate. The answer is clear with appropriate use of specialist terminology.	5–6															
2	Explanation of function of at least two types of neurons is relevant but detail/ application to Pavel is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology.	3–4															
1	Explanation of the function of neurons is very limited. The answer is vague/muddled. Specialist terminology is either absent or inappropriately used.	1–2															
0	No creditable content.	0															

Question	Marking guidance	Total marks									
<p><b>06</b></p>	<p><b>Discuss split brain research.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• In split brain patients the corpus callosum has been cut and stimuli could be presented to each hemisphere separately.</li> <li>• Stimulus sent to the right visual field (RVF) of the eyes would be processed in the left hemisphere (access to language centres).</li> <li>• Stimulus sent to the left visual field (LVF) of the eyes would be processed in the right hemisphere (no access to language centres).</li> <li>• Description of research by Sperry (1950s) and the experimental procedure known as divided field (position of participant, flashing of words or objects on either side of focus point etc).</li> <li>• Description of findings: words or objects displayed to LVF could be drawn; words or images displayed to RVF could be named.</li> <li>• Sperry (1965) split brain study on word processing showed the right hemisphere had some basic language ability.</li> <li>• Use of non-verbal stimuli (eg Gazzaniga 2005) - used faces. Found right hemisphere was better at matching shapes and showed superiority on visuo-spatial tasks.</li> <li>• Recent research (Turk et al, 2002) found that right hemisphere is generally better at face processing, the left hemisphere appears to play an important role in self-recognition.</li> </ul> <p><b>Possible discussion:</b></p> <ul style="list-style-type: none"> <li>• Advancement of knowledge – ground breaking research that changed view of hemisphere function and lateralisation.</li> <li>• Use of small sample (N = 10–15) - difficult to generalise as they might not represent all split brain patients.</li> <li>• Issues with generalisation: patients studied have been a very varied group, eg gender, age, handedness etc; operations were not always comparable (in some cases there might have been some limited communication between hemispheres).</li> <li>• Most research involved artificial set-ups in order to ensure control of variables (exposure of stimuli to one visual field only); results are not relevant for everyday life.</li> </ul> <p>Credit other relevant material.</p> <table border="1" data-bbox="284 1630 1318 2016"> <thead> <tr> <th data-bbox="284 1630 408 1682">Level</th> <th data-bbox="408 1630 1203 1682">Description</th> <th data-bbox="1203 1630 1318 1682">Marks</th> </tr> </thead> <tbody> <tr> <td data-bbox="284 1682 408 1834">4</td> <td data-bbox="408 1682 1203 1834">Knowledge of split brain research is accurate and generally well detailed. Discussion is effective. The answer is clear, organised and focused. Specialist terminology is mostly used effectively.</td> <td data-bbox="1203 1682 1318 1834">10–12</td> </tr> <tr> <td data-bbox="284 1834 408 2016">3</td> <td data-bbox="408 1834 1203 2016">Knowledge of split brain research is evident but there are occasional inaccuracies/omissions. There is some appropriate discussion. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.</td> <td data-bbox="1203 1834 1318 2016">7–9</td> </tr> </tbody> </table>	Level	Description	Marks	4	Knowledge of split brain research is accurate and generally well detailed. Discussion is effective. The answer is clear, organised and focused. Specialist terminology is mostly used effectively.	10–12	3	Knowledge of split brain research is evident but there are occasional inaccuracies/omissions. There is some appropriate discussion. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.	7–9	<p><b>12</b></p> <p><b>AO1 = 6</b> <b>AO3 = 6</b></p>
Level	Description	Marks									
4	Knowledge of split brain research is accurate and generally well detailed. Discussion is effective. The answer is clear, organised and focused. Specialist terminology is mostly used effectively.	10–12									
3	Knowledge of split brain research is evident but there are occasional inaccuracies/omissions. There is some appropriate discussion. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.	7–9									

	<b>2</b>	Limited knowledge of split brain research is present. There is some limited discussion. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately.	<b>4–6</b>	
	<b>1</b>	Knowledge of split brain research is very limited. Discussion is limited, poorly focused or absent. The answer lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.	<b>1–3</b>	
	<b>0</b>	No creditable content.		



**Section B: Cognitive Development**

**Total for this section: 30 marks**

Question	Marking guidance	Total marks												
07	<p><b>Ameeta is six months old. In a violation of expectation study Ameeta watched toy cars move along a track. As they moved along the track the cars passed behind a tall screen which had a window at the top. Ameeta watched two different cars moving along the track.</b></p> <p><b>Condition 1: A small car moved along the track. It was not visible in the window.</b></p> <p><b>Condition 2: A tall car moved along the track. Although it should have been visible through the window, it was not.</b></p> <p><b>The researchers found that Ameeta looked much longer in Condition 2 than in Condition 1.</b></p> <p><b>Explain why Ameeta spent much longer looking in Condition 2. Refer to Baillargeon’s violation of expectation research in your answer.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Condition 1 is similar to Baillargeon’s expected/possible event. Condition 2 is similar to Baillargeon’s unexpected/impossible event.</li> <li>• The fact that Ameeta spent much longer looking in Condition 2 suggests that she was surprised that she couldn’t see the large car in the window. This event violated her expectation that she should have seen the large car in the window.</li> <li>• Ameeta knew the large car continued to exist when it went behind the screen.</li> </ul> <p>Credit other relevant application</p> <table border="1" data-bbox="284 1400 1316 1780"> <thead> <tr> <th>Level</th> <th>Description</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Baillargeon’s violation of expectation research is applied to Ameeta in some detail. The answer is clear with appropriate use of specialist terminology.</td> <td>3–4</td> </tr> <tr> <td>1</td> <td>Baillargeon’s violation of expectation research is applied to Ameeta, but the application lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.</td> <td>1–2</td> </tr> <tr> <td>0</td> <td>No creditable content.</td> <td></td> </tr> </tbody> </table>	Level	Description	Marks	2	Baillargeon’s violation of expectation research is applied to Ameeta in some detail. The answer is clear with appropriate use of specialist terminology.	3–4	1	Baillargeon’s violation of expectation research is applied to Ameeta, but the application lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2	0	No creditable content.		<p><b>4</b></p> <p><b>AO2 = 4</b></p>
Level	Description	Marks												
2	Baillargeon’s violation of expectation research is applied to Ameeta in some detail. The answer is clear with appropriate use of specialist terminology.	3–4												
1	Baillargeon’s violation of expectation research is applied to Ameeta, but the application lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2												
0	No creditable content.													

Question	Marking guidance	Total marks
08.1	<p><b>What is meant by theory of mind?</b></p> <p><b>2 marks</b> for a clear explanation of theory of mind.  <b>1 mark</b> for a limited/vague/muddled explanation of theory of mind.</p> <p><b>Content:</b>                      Theory of mind is the understanding that other people have their own beliefs, intentions, knowledge etc which may differ to ours.                      It is the ability to see/understand the world from someone else’s perspective.</p>	<p><b>2</b></p> <p><b>AO1 = 2</b></p>

Question	Marking guidance	Total marks												
08.2	<p><b>Describe what researchers have found out about the theory of mind in the Sally-Anne studies.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Children under the age of four tend to fail the unexpected transfer task (state that Sally will look for the marble in the basket).</li> <li>• TOM is developing from four years onwards.</li> <li>• Credit reference to specific studies, eg Baron-Cohen et al - The ‘belief question was correctly answered by 86% of the children with Down’s Syndrome, by 85% of typically developed children and by 20% of the children with autism.</li> <li>• Children with autism have difficulty in putting themselves in someone else’s shoes and taking the perspective of others.</li> </ul> <p>Credit other relevant content (findings and conclusions).                      Answers describing the methodology cannot gain any credit.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Description</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>What researchers have found out about theory of mind in the Sally-Anne studies is accurate and has some detail. The answer is clear with appropriate use of specialist terminology.</td> <td>3–4</td> </tr> <tr> <td>1</td> <td>What researchers have found out about theory of mind in the Sally-Anne studies lacks detail/accuracy. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.</td> <td>1–2</td> </tr> <tr> <td>0</td> <td>No creditable content.</td> <td></td> </tr> </tbody> </table>	Level	Description	Marks	2	What researchers have found out about theory of mind in the Sally-Anne studies is accurate and has some detail. The answer is clear with appropriate use of specialist terminology.	3–4	1	What researchers have found out about theory of mind in the Sally-Anne studies lacks detail/accuracy. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2	0	No creditable content.		<p><b>4</b></p> <p><b>AO1 = 4</b></p>
Level	Description	Marks												
2	What researchers have found out about theory of mind in the Sally-Anne studies is accurate and has some detail. The answer is clear with appropriate use of specialist terminology.	3–4												
1	What researchers have found out about theory of mind in the Sally-Anne studies lacks detail/accuracy. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2												
0	No creditable content.													

Question	Marking guidance	Total marks									
09	<p><b>Describe and evaluate Piaget’s theory of cognitive development.</b></p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>Refers to development of thinking skills which supposedly occurs in discrete stages, marked by qualitative differences.</li> <li>This development is seen as a progressive reorganisation of mental processes as a result of biological maturation and environmental experiences.</li> <li>Description of stages: Sensorimotor stage (0–2 years – development of object permanence); pre-operational stage (2–7 years – use of words as symbols for objects, egocentrism); concrete operational stage (7–11 years – beginning of operational or logical thought demonstrated by ability to work things out in head, conversation); formal operational stage (11 + years – ability to abstract thought and reasoning, logical thinking, hypothesis testing).</li> <li>Description of other key components/processes: schema and adaptation (assimilation, accommodation, equilibration).</li> </ul> <p><b>Possible evaluation:</b></p> <ul style="list-style-type: none"> <li>Influential research with historical importance – implementations in educational policies and teaching practice by regarding children as active learners who have to be ‘ready’ for certain learning.</li> <li>Supporting research evidence: eg Piaget and Inhelder, 1967 – three mountains task.</li> <li>Contradictory research evidence suggesting that Piaget underestimated the ages: eg McGarrigle and Donaldson, 1974 – glove puppet (‘Naughty Teddy’) research; Baillargeon.</li> <li>Criticism that the formal operations are not universal as suggested by Piaget, eg only one-third of adults reach the formal operations stage.</li> <li>Criticism of his methods – observations and interviews – may be open to bias, and were often carried out by him alone.</li> <li>Small sample – studied his own children as well as children of colleagues in Geneva which led to generalisation issues.</li> <li>Alternative explanations of cognitive development, eg Vygotsky’s theory which emphasises the social environment.</li> <li>Central concepts of the theory like ‘schema’ are not objectively observable.</li> </ul> <p>Credit other relevant content.</p> <table border="1" data-bbox="284 1630 1318 2022"> <thead> <tr> <th data-bbox="284 1630 408 1697">Level</th> <th data-bbox="408 1630 1203 1697">Description</th> <th data-bbox="1203 1630 1318 1697">Marks</th> </tr> </thead> <tbody> <tr> <td data-bbox="284 1697 408 1899">4</td> <td data-bbox="408 1697 1203 1899">Knowledge of Piaget’s theory of cognitive development is mostly accurate and generally well detailed. Evaluation is mostly effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear and focused. Specialist terminology is mostly used effectively.</td> <td data-bbox="1203 1697 1318 1899">16–20</td> </tr> <tr> <td data-bbox="284 1899 408 2022">3</td> <td data-bbox="408 1899 1203 2022">Knowledge of Piaget’s theory of cognitive development is evident but there are occasional inaccuracies/omissions. There is some effective evaluation. The answer is mostly</td> <td data-bbox="1203 1899 1318 2022">11–15</td> </tr> </tbody> </table>	Level	Description	Marks	4	Knowledge of Piaget’s theory of cognitive development is mostly accurate and generally well detailed. Evaluation is mostly effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear and focused. Specialist terminology is mostly used effectively.	16–20	3	Knowledge of Piaget’s theory of cognitive development is evident but there are occasional inaccuracies/omissions. There is some effective evaluation. The answer is mostly	11–15	<p><b>20</b></p> <p><b>AO1 = 8</b> <b>AO3 = 12</b></p>
Level	Description	Marks									
4	Knowledge of Piaget’s theory of cognitive development is mostly accurate and generally well detailed. Evaluation is mostly effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear and focused. Specialist terminology is mostly used effectively.	16–20									
3	Knowledge of Piaget’s theory of cognitive development is evident but there are occasional inaccuracies/omissions. There is some effective evaluation. The answer is mostly	11–15									

		clear and organised but occasionally lacks focus. Specialist terminology is mostly used appropriately.		
	<b>2</b>	Limited knowledge of Piaget’s theory of cognitive development is present. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately.	<b>6–10</b>	
	<b>1</b>	Knowledge of Piaget’s theory of cognitive development 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.	<b>1–5</b>	
	<b>0</b>	No creditable content.	<b>0</b>	

**Section C: Research Methods 1**

**Total for this section: 30 marks**

Question	Marking guidance	Total marks
<p><b>10</b></p>	<p><b>A teacher read a report featuring a meta-analysis of smartphone use amongst teenagers. She decided to conduct her own research into the relationship between quality of sleep and smartphone use. The teacher told her class about her study and asked them if they would be willing to take part as participants. She gave every student a piece of paper and asked them to write down two pieces of information:</b></p> <ul style="list-style-type: none"> <li>• <b>A score out of 5 for the quality of their sleep on the previous night (a score of 1 = poor sleep and a score of 5 = excellent sleep).</b></li> <li>• <b>The total number of hours they had used their smartphone on the previous day.</b></li> </ul> <p><b>What is meant by a meta-analysis?</b></p> <p><b>2 marks</b> for a clear and coherent description of what a meta-analysis is.  <b>1 mark</b> for a limited or muddled description of what a meta-analysis is.</p> <p><b>Content:</b>                      Meta-analysis is a method that combines (secondary) data from other studies in order to create a larger set of meta-data which can be further analysed using descriptive and inferential techniques.</p>	<p><b>2</b></p> <p><b>AO1 = 2</b></p>

Question	Marking guidance	Total marks															
<p><b>11</b></p>	<p><b>Write an appropriate non-directional hypothesis for the teacher’s study.</b></p> <p>There is a relationship/correlation between the quality of sleep rating scored out of 5 and the number of hours spent using a smartphone in a day.</p> <p>No marks for a hypothesis stating a difference or a directional hypothesis.</p> <table border="1" data-bbox="284 1514 1318 1901"> <thead> <tr> <th data-bbox="284 1514 408 1565">Level</th> <th data-bbox="408 1514 1203 1565">Description</th> <th data-bbox="1203 1514 1318 1565">Marks</th> </tr> </thead> <tbody> <tr> <td data-bbox="284 1565 408 1648"><b>3</b></td> <td data-bbox="408 1565 1203 1648">For an appropriate non-directional hypothesis, with both co-variables operationalised.</td> <td data-bbox="1203 1565 1318 1648"><b>3</b></td> </tr> <tr> <td data-bbox="284 1648 408 1767"><b>2</b></td> <td data-bbox="408 1648 1203 1767">For a non-directional hypothesis with both co-variables, but lacking clarity or where only one co-variable is operationalised.</td> <td data-bbox="1203 1648 1318 1767"><b>2</b></td> </tr> <tr> <td data-bbox="284 1767 408 1850"><b>1</b></td> <td data-bbox="408 1767 1203 1850">For a muddled non-directional hypothesis with both co-variables but neither operationalised.</td> <td data-bbox="1203 1767 1318 1850"><b>1</b></td> </tr> <tr> <td data-bbox="284 1850 408 1901"><b>0</b></td> <td data-bbox="408 1850 1203 1901">No creditable content.</td> <td data-bbox="1203 1850 1318 1901"></td> </tr> </tbody> </table>	Level	Description	Marks	<b>3</b>	For an appropriate non-directional hypothesis, with both co-variables operationalised.	<b>3</b>	<b>2</b>	For a non-directional hypothesis with both co-variables, but lacking clarity or where only one co-variable is operationalised.	<b>2</b>	<b>1</b>	For a muddled non-directional hypothesis with both co-variables but neither operationalised.	<b>1</b>	<b>0</b>	No creditable content.		<p><b>3</b></p> <p><b>AO2 = 3</b></p>
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<b>3</b>	For an appropriate non-directional hypothesis, with both co-variables operationalised.	<b>3</b>															
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<b>0</b>	No creditable content.																

Question	Marking guidance	Total marks
12	<p><b>Identify the sampling method the teacher used. Explain your answer.</b></p> <p><b>1 mark</b> for opportunity sample.</p> <p>A further 2 marks awarded as follows:  <b>2 marks</b> for a clear and coherent explanation of opportunity sampling.  <b>1 mark</b> for a limited or muddled explanation.</p> <p><b>Content:</b>                      She used opportunity sampling.                      The teacher used her own class which was conveniently available.</p>	<p><b>3</b></p> <p><b>AO2 = 3</b></p>

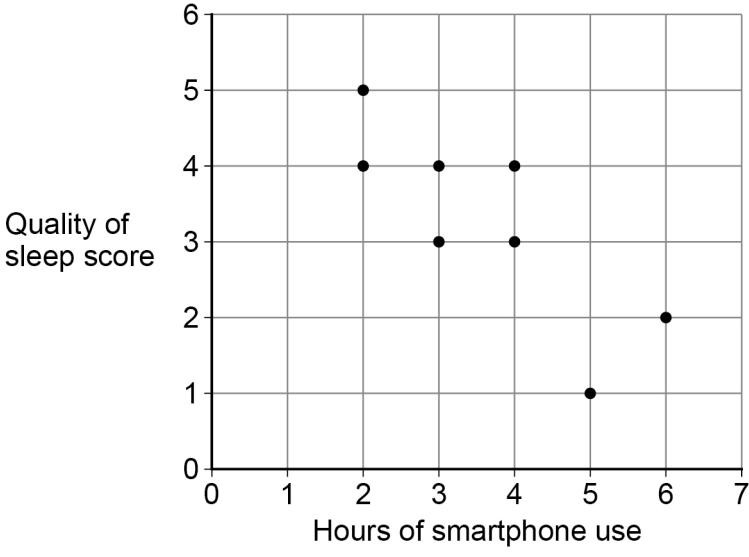
Question	Marking guidance	Total marks
13	<p><b>Briefly explain one problem with how the quality of sleep was measured in this study.</b></p> <p><b>2 marks</b> for a clear and coherent explanation.  <b>1 mark</b> for a limited or muddled explanation.</p> <p><b>Possible content:</b></p> <ul style="list-style-type: none"> <li>• Self-report measures are of questionable validity.</li> <li>• This is a subjective measure as the rating is perceived differently by each person. This makes it difficult to compare one person's ratings with another person's ratings.</li> <li>• The rating might be subject to demand characteristics and students might rate their quality of sleep by how they wish to be perceived by the teacher rather than how they really slept.</li> </ul> <p>Credit any other relevant material.</p>	<p><b>2</b></p> <p><b>AO2 = 2</b></p>

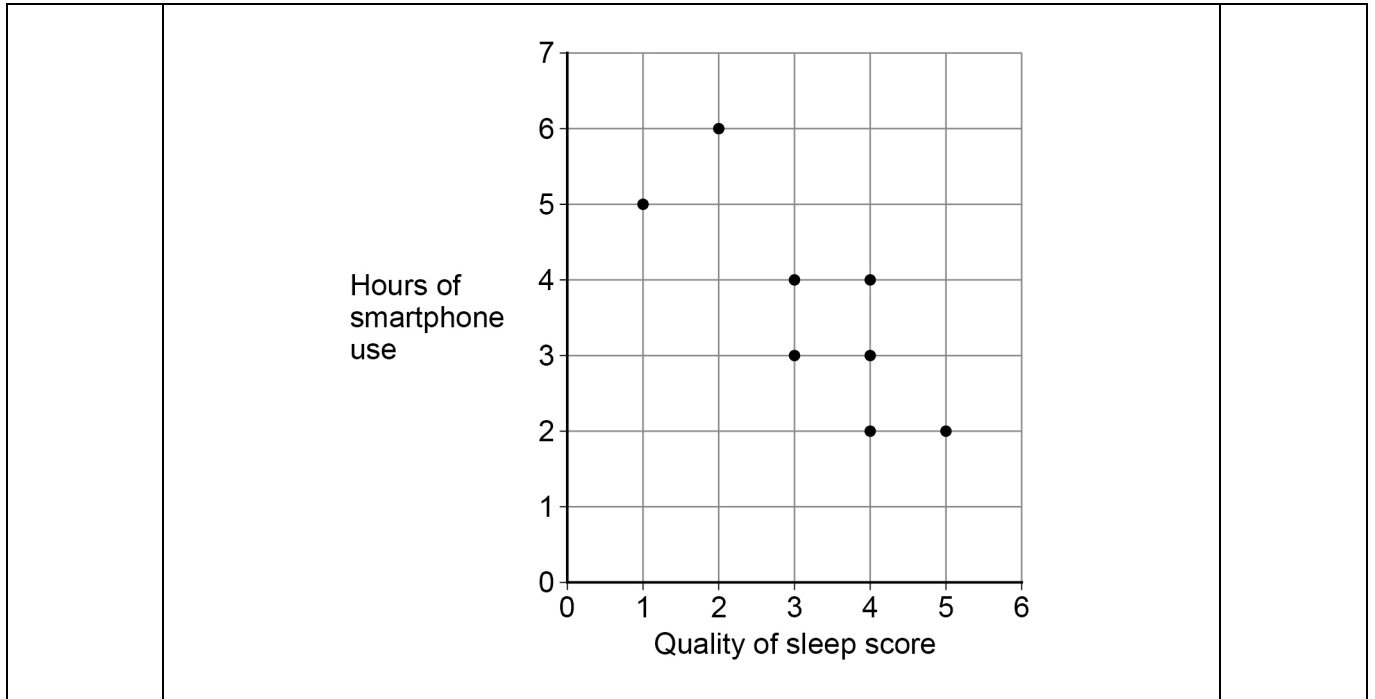
Question	Marking guidance	Total marks															
14	<p><b>Consent and confidentiality are two ethical issues.</b></p> <p><b>Explain how the teacher could have obtained consent from her students and ensured confidentiality of their data.</b></p> <p><b>Possible answer:</b></p> <ul style="list-style-type: none"> <li>• Consent – The researcher has to obtain fully informed consent by asking her students for their permission by signing a consent form. The teacher should provide information on the aim of her investigation, what the students were required to do, how long it would take and that they could withdraw themselves at any time. Accept parental consent.</li> <li>• Confidentiality – To ensure that the student’s data is kept confidential, the teacher should not ask them to write down their name but should use code numbers instead. She should also ensure that the data is stored safely. The teacher could ask another researcher who does not know the students to collect the data. Confidentiality would be stressed in the brief/debrief.</li> </ul> <table border="1" data-bbox="284 904 1318 1485"> <thead> <tr> <th data-bbox="284 904 408 943">Level</th> <th data-bbox="408 904 1203 943">Description</th> <th data-bbox="1203 904 1318 943">Marks</th> </tr> </thead> <tbody> <tr> <td data-bbox="284 943 408 1043">3</td> <td data-bbox="408 943 1203 1043">Explanation of how the teacher could obtain consent and ensure confidentiality is detailed. The answer is clear with appropriate use of specialist terminology.</td> <td data-bbox="1203 943 1318 1043">5–6</td> </tr> <tr> <td data-bbox="284 1043 408 1245">2</td> <td data-bbox="408 1043 1203 1245">Explanation of how the teacher could obtain consent and ensure confidentiality is relevant but detail/application is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology. OR: Only consent or confidentiality has been answered at level 3.</td> <td data-bbox="1203 1043 1318 1245">3–4</td> </tr> <tr> <td data-bbox="284 1245 408 1447">1</td> <td data-bbox="408 1245 1203 1447">Explanation of how the teacher could obtain consent and/or ensure confidentiality is limited/vague/muddled. Specialist terminology is either absent or inappropriately used. OR: Only consent or confidentiality has been answered at level 1/2.</td> <td data-bbox="1203 1245 1318 1447">1–2</td> </tr> <tr> <td data-bbox="284 1447 408 1485">0</td> <td data-bbox="408 1447 1203 1485">No creditable content.</td> <td data-bbox="1203 1447 1318 1485">0</td> </tr> </tbody> </table>	Level	Description	Marks	3	Explanation of how the teacher could obtain consent and ensure confidentiality is detailed. The answer is clear with appropriate use of specialist terminology.	5–6	2	Explanation of how the teacher could obtain consent and ensure confidentiality is relevant but detail/application is lacking. The answer lacks clarity in places. There is some appropriate use of specialist terminology. OR: Only consent or confidentiality has been answered at level 3.	3–4	1	Explanation of how the teacher could obtain consent and/or ensure confidentiality is limited/vague/muddled. Specialist terminology is either absent or inappropriately used. OR: Only consent or confidentiality has been answered at level 1/2.	1–2	0	No creditable content.	0	<p><b>6</b></p> <p><b>AO2 = 6</b></p>
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3	Explanation of how the teacher could obtain consent and ensure confidentiality is detailed. The answer is clear with appropriate use of specialist terminology.	5–6															
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1	Explanation of how the teacher could obtain consent and/or ensure confidentiality is limited/vague/muddled. Specialist terminology is either absent or inappropriately used. OR: Only consent or confidentiality has been answered at level 1/2.	1–2															
0	No creditable content.	0															

Question	Marking guidance	Total marks
15	<p><b>The teacher wanted to calculate a measure of central tendency for smartphone use. Briefly explain why the mode would not be an appropriate measure of central tendency for this data.</b></p> <p><b>2 marks</b> for a clear and coherent explanation.  <b>1 mark</b> for a limited or muddled explanation.</p> <p><b>Possible answer:</b></p> <ul style="list-style-type: none"> <li>• For the data on smartphone use there are 3 modes (2, 3, 4). Therefore, there is no single precise answer of the average for the set of data.</li> <li>• The data for smartphone use consists of a sample of only 8 students. The mode can be unreliable for small data sets as it is affected by small changes.</li> </ul> <p>Credit also answers referring to level of data.</p> <p>Credit any other relevant material.</p>	<p><b>2</b></p> <p><b>AO2 = 2</b></p>

Question	Marking guidance	Total marks
16	<p><b>The teacher then decided to plot her data on a scattergram.</b></p> <p><b>Explain what is meant by a scattergram.</b></p> <p><b>2 marks</b> for a clear and coherent explanation.  <b>1 mark</b> for a limited or muddled explanation.</p> <p>Answer: A scattergram is a graphical presentation of a relationship between two co-variables.</p>	<p><b>2</b></p> <p><b>AO1 = 2</b></p>



Question	Marking guidance	Total marks																		
<p>17</p>	<p><b>Draw an appropriate scattergram using the data in table 1.</b></p> <p>Award marks as follows:</p> <ul style="list-style-type: none"> <li>• <b>1 mark:</b> title with fully operationalised variables, eg (A scattergram showing) the relationship between quality of sleep score and hours of smartphone use.</li> <li>• <b>2 marks</b> for labelling axes: 1 mark each axis: quality of sleep score/rating (1–5); hours of smartphone use.</li> <li>• <b>1 mark</b> for correctly plotting the data.</li> </ul> <p style="text-align: center;">Title: A scattergram showing the relationship between quality of sleep score and hours of smartphone use</p> <div style="text-align: center;">  <table border="1" style="margin: 10px auto;"> <caption>Data points from the scattergram</caption> <thead> <tr> <th>Hours of smartphone use</th> <th>Quality of sleep score</th> </tr> </thead> <tbody> <tr><td>2</td><td>5</td></tr> <tr><td>2</td><td>4</td></tr> <tr><td>3</td><td>4</td></tr> <tr><td>3</td><td>3</td></tr> <tr><td>4</td><td>4</td></tr> <tr><td>4</td><td>3</td></tr> <tr><td>5</td><td>1</td></tr> <tr><td>6</td><td>2</td></tr> </tbody> </table> </div> <p style="text-align: center;">Title: A scattergram showing the relationship between quality of sleep score and hours of smartphone use</p>	Hours of smartphone use	Quality of sleep score	2	5	2	4	3	4	3	3	4	4	4	3	5	1	6	2	<p><b>4</b></p> <p><b>AO2 = 4</b></p>
Hours of smartphone use	Quality of sleep score																			
2	5																			
2	4																			
3	4																			
3	3																			
4	4																			
4	3																			
5	1																			
6	2																			



Question	Marking guidance	Total marks
18	<p><b>Use your scattergram to identify and explain the type of correlation found in the study.</b></p> <p><b>1 mark</b> for negative correlation/relationship.</p> <p>A further 2 marks awarded as follows:  <b>2 marks</b> for a clear and coherent explanation of why the correlation is negative.  <b>1 mark</b> for a limited or muddled explanation.</p> <p><b>Content:</b></p> <ul style="list-style-type: none"> <li>• Negative correlation/relationship.</li> <li>• The greater the smart phone use the worse the quality of sleep rating (or vice versa).</li> <li>• The correlation/relationship is moderate/strong.</li> </ul>	<p><b>3</b></p> <p><b>AO2 = 3</b></p>

Question	Marking guidance	Total marks									
19	<p><b>The teacher decided to carry out a follow-up study to see if increased smartphone use causes poor sleep quality.</b></p> <p><b>Explain why an experiment would be a suitable method for her follow-up study.</b></p> <p><i>Possible content:</i></p> <ul style="list-style-type: none"> <li>• She will be able to establish whether smartphone use (cause) affects quality of sleep.</li> <li>• She can manipulate the smartphone use (the IV) and measure the effect on the quality of sleep (the DV).</li> <li>• She can control other variables which may have had an effect on quality of sleep (eg what students use the phone for).</li> <li>• An experiment would be easier to replicate.</li> </ul> <p>Credit references to reliability and/or validity.</p> <p>Credit other relevant material.</p> <table border="1" data-bbox="284 1659 1321 1984"> <thead> <tr> <th>Level</th> <th>Description</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>Explanation of why an experiment would be suitable is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.</td> <td>3</td> </tr> <tr> <td>2</td> <td>Explanation of why an experiment would be suitable is relevant but detail is lacking. The answer lacks clarity in places.</td> <td>2</td> </tr> </tbody> </table>	Level	Description	Marks	3	Explanation of why an experiment would be suitable is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.	3	2	Explanation of why an experiment would be suitable is relevant but detail is lacking. The answer lacks clarity in places.	2	<p><b>3</b></p> <p><b>AO2 = 3</b></p>
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	<b>1</b>	Explanation of why an experiment would be suitable is very limited. The answer is vague/muddled.	<b>1</b>	
	<b>0</b>	No creditable content.	<b>0</b>	

**PS02 grid**

	<b>AO1</b>	<b>AO2</b>	<b>AO3</b>	<b>Total</b>
<b>Section A</b>				
01	1			<b>1</b>
02	2			<b>2</b>
03	3			<b>3</b>
04	6			<b>6</b>
05		6		<b>6</b>
06	6		6	<b>12</b>
<b>Section B</b>				
07		4		<b>4</b>
08.1	2			<b>2</b>
08.2	4			<b>4</b>
09	8		12	<b>20</b>
<b>Section C</b>				
10	2			<b>2</b>
11		3		<b>3</b>
12		3		<b>3</b>
13		2		<b>2</b>
14		6		<b>6</b>
15		2		<b>2</b>
16	2			<b>2</b>
17		4		<b>4</b>
18		3		<b>3</b>
19		3		<b>3</b>
<b>Unit total</b>	<b>36</b>	<b>36</b>	<b>18</b>	<b>90</b>