

INTERNATIONAL AS PSYCHOLOGY PS02

Unit 2 Biopsychology, Development and Research Methods 1

Mark scheme

January 2024

Version: 1.0 Final



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

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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	Describe the function of the somatic nervous system. Award marks as follows: 3 marks: The description of the somatic nervous system is detailed. The answer is clear with appropriate use of specialist terminology. 2 marks: The description of the somatic nervous system lacks detail. The answer lacks clarity in places. 1 mark: The description of the somatic nervous system is briefly presented. The answer is very limited/vague/muddled. Possible content • Maintains communication between the CNS and the outside world. • Sensory neurons transmit information about the environment from receptors in the various senses to the central nervous system. • Motor neurons send messages from the central nervous system to the muscles/effectors to control voluntary/conscious activity. • Contains all the neurons that are not relay/in the CNS.	3 AO1 = 3

Question	Marking Guidance	Total Marks
02	Describe the function of the autonomic nervous system. Award marks as follows: 3 marks: The description of the autonomic nervous system is detailed. The answer is clear with appropriate use of specialist terminology. 2 marks: The description of the autonomic nervous system lacks detail. The answer lacks clarity in places. 1 mark: The description of the autonomic nervous system is briefly presented. The answer is very limited/vague/muddled. Possible content • Controls involuntary bodily functions such as heart rate and digestion. • Transmits information to and from the smooth-muscle organs such as the heart and digestive system. • Its sympathetic branch is involved in the fight and flight response, preparing the body to respond to a threat. • Its parasympathetic branch is involved in the rest and relax response, reversing the effects of the sympathetic branch and restoring normal functioning.	3 AO1 = 3

Question	Marking Guidance	Total Marks												
03	Explain the function of the endocrine system. Possible content • It controls or regulates the activity of particular cells or organs (internal physiological regulations). • It does this via glands secreting hormones directly into the bloodstream. • Hormones released by these glands are vital to most of the physiological functions of the body. • The hypothalamus controls the endocrine system through the pituitary gland. • The pituitary gland controls other endocrine glands. Credit an example of the function of a gland and its associated hormone. Credit reference to the fight or flight response if linked to the endocrine system. <table border="1"> <thead> <tr> <th>Level</th><th>Description</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>2</td><td>Explanation of the function of the endocrine system is described in some detail. The answer is clear with appropriate use of specialist terminology.</td><td>3–4</td></tr> <tr> <td>1</td><td>Explanation of the function of the endocrine system 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>0</td></tr> </tbody> </table>	Level	Description	Marks	2	Explanation of the function of the endocrine system is described in some detail. The answer is clear with appropriate use of specialist terminology.	3–4	1	Explanation of the function of the endocrine system lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2	0	No creditable content.	0	4 AO1 = 4
Level	Description	Marks												
2	Explanation of the function of the endocrine system is described in some detail. The answer is clear with appropriate use of specialist terminology.	3–4												
1	Explanation of the function of the endocrine system lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2												
0	No creditable content.	0												

Question	Marking Guidance	Total Marks
04	Amour is a split brain patient who had her right and left hemispheres separated. Amour takes part in an experimental procedure known as the divided field. In this experiment, an object is flashed to one visual field only. The researcher flashes a picture of a tree to the left visual field of Amour's left eye. When the researcher asks Amour to name the object she saw, Amour is unable to name or give any description of the tree. However, Amour is able to draw the tree with her left hand. Describe and evaluate split brain research. Refer to Amour in your answer. Possible content • In split brain patients the corpus callosum has been cut and stimuli can be presented to each hemisphere separately. • Stimuli sent to the right visual field (RVF) of the eyes would be processed in the left hemisphere (access to language centres). • Stimuli sent to the left visual field (LVF) of the eyes would be processed in the right hemisphere (no access to language centres). • Description of research by Sperry (1965) and the experimental procedure known as divided field (position of participant, flashing of words or objects on either side of focus point etc). • Description of findings: words or objects displayed to LVF could be drawn; words or images displayed to RVF could be named. • Sperry (1965) split brain study on word processing showed the right hemisphere had some basic language ability. • Use of non-verbal stimuli (Gazzaniga, 2005) – faces, found the right hemisphere was better at matching shapes and showed superiority on visuo-spatial tasks. • Research (Turk et al, 2002) found that the right hemisphere is generally better at face processing, the left hemisphere appears to play an important role in self-recognition. Possible application • The image of the tree perceived in the left visual field is processed by Amour's right hemisphere. • For most people, including Amour, the language centres are found in the left hemisphere. • Due to the hemispheres being separated Amour's hemispheres cannot exchange information. • Amour has no access to her language centres and is therefore unable to name/describe the tree. • Amour is able to draw the tree with her left hand as the left hand is controlled by the right hemisphere.	20 AO1 = 8 AO2 = 4 AO3 = 8

Possible evaluation

- Advancement of knowledge: ground breaking research that changed view of hemisphere function and lateralisation.
- Use of small samples (N = 10–15): difficult to generalise as they might not represent all split brain patients.
- 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 in fact some limited communication between hemispheres).
- 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.

Credit other relevant material.

Level	Description	Marks
4	Knowledge of split brain research is mostly accurate and generally well detailed. Evaluation is mostly effective. Application is appropriate. 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 split brain research is evident but there are occasional inaccuracies/omissions. There is some effective evaluation/application. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is mostly used appropriately.	11–15
2	Limited knowledge of split brain research is present. Any evaluation/application is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately.	6–10
1	Knowledge of split brain research is very limited. 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.	1–5
0	No creditable content.	0

Section B: Cognitive Development

Total for this section: 30 marks

Question	Marking Guidance	Total Marks
05	Below are four statements describing cognitive development. Which one of the following statements does not describe cognitive development according to Vygotsky's theory? Answer key: C – Cognitive development occurs in stages.	1 AO1 = 1

Question	Marking Guidance	Total Marks
06	Briefly outline what is meant by the term scaffolding, in cognitive development. Award marks as follows: 2 marks for a clear outline of scaffolding. 1 mark for a muddled or vague outline of scaffolding. Content: Scaffolding is the help or support given to a child by a more knowledgeable other (an adult or more competent peer). It allows the child to work within their zone of proximal development.	2 AO1 = 2

Question	Marking Guidance	Total Marks
07	What is meant by theory of mind? Award marks as follows: 3 marks: The description of theory of mind is detailed. The answer is clear with appropriate use of specialist terminology. 2 marks: The description of theory of mind lacks detail. The answer lacks clarity in places. 1 mark: The description of theory of mind is briefly presented. The answer is very limited/vague/muddled. Content • It is the understanding that other people have their own beliefs, intentions, knowledge, etc which may differ from our own. • It is the ability to see/understand the world from someone else's perspective. • It enables humans to guess what other people are thinking or feeling. Credit use of an example to describe theory of mind. Credit other relevant content.	3 AO1 = 3

Question	Marking Guidance	Total Marks												
08	Wilma and Abe are 4 months old and take part in a study investigating violation of expectation. A large train and a small train move along a track and pass behind a screen with a window. The large train can be seen in the window but not the small train. Abe is in the control condition and only sees the small train which disappears behind the screen. It cannot be seen in the window. Wilma is in the experimental condition and watches as the large train disappears behind the screen. Although the train should be seen in the window, it does not appear. The researcher finds that Wilma looks longer at the screen than Abe. Using your knowledge of Baillargeon's violation of expectation research, explain why Wilma looks longer at the screen than Abe. Possible application • Wilma sees the unexpected/impossible event; the large train cannot be seen in the window even though it should be. • The fact that Wilma spends longer looking at the screen suggests that she is surprised that she is unable to see the large train in the window. This event violates her expectation that she should be able to see the large train in the window and this causes her to look at the screen for longer. • Abe sees the expected/possible event because the small train is too small to be seen. • Contrary to Wilma, Abe's expectations are not violated as he knows that the small train is too small to be seen in the window. Therefore, he is less interested in looking at the screen and spends less time looking at it. <table border="1" data-bbox="300 1317 1310 2065"> <thead> <tr> <th>Level</th><th>Description</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>3</td><td>Application of Baillargeon's violation of expectation research to Wilma and Abe is detailed and appropriate. The answer is clearly explaining why Wilma looks longer at the screen with appropriate use of terminology.</td><td>5–6</td></tr> <tr> <td>2</td><td>Application of Baillargeon's violation of expectation research to Wilma and Abe is relevant but detail is lacking. The answer lacks clarity in places. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 3.</td><td>3–4</td></tr> <tr> <td>1</td><td>Application of Baillargeon's violation of expectation research is very limited. The answer is vague/muddled. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 2.</td><td>1–2</td></tr> </tbody> </table>	Level	Description	Marks	3	Application of Baillargeon's violation of expectation research to Wilma and Abe is detailed and appropriate. The answer is clearly explaining why Wilma looks longer at the screen with appropriate use of terminology.	5–6	2	Application of Baillargeon's violation of expectation research to Wilma and Abe is relevant but detail is lacking. The answer lacks clarity in places. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 3.	3–4	1	Application of Baillargeon's violation of expectation research is very limited. The answer is vague/muddled. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 2.	1–2	6 AO2 = 6
Level	Description	Marks												
3	Application of Baillargeon's violation of expectation research to Wilma and Abe is detailed and appropriate. The answer is clearly explaining why Wilma looks longer at the screen with appropriate use of terminology.	5–6												
2	Application of Baillargeon's violation of expectation research to Wilma and Abe is relevant but detail is lacking. The answer lacks clarity in places. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 3.	3–4												
1	Application of Baillargeon's violation of expectation research is very limited. The answer is vague/muddled. OR Application of Baillargeon's violation of expectation research to either Wilma or Abe at Level 2.	1–2												

	<table border="1"> <tr> <td>0</td><td>No creditable content.</td><td>0</td></tr> </table>	0	No creditable content.	0	
0	No creditable content.	0			

Question	Marking Guidance	Total Marks															
09	Describe the procedure and findings of one study that investigates Piaget's theory of cognitive development. Possible content • Use of a model of three mountains placed on a table in order to test egocentricity in children of different ages (Piaget and Inhelder, 1967). • Children were encouraged to explore the model and walk around it to see it from all sides. • A small doll was placed at different points on the table, and the children were asked to carry out several tasks in order to test their ability to put themselves into the doll's viewpoint. • The child was given (ten) pictures and asked to select the one which the doll could see. • Children under the age of seven were unable to select the correct picture showing the doll's viewpoint. Instead, they would choose their own viewpoint. This suggests that they are unable to decentre. Credit description of findings and procedure of other relevant studies, eg class inclusion studies, conservation studies. If more than one study included, credit the best one. <table border="1"> <thead> <tr> <th>Level</th><th>Description</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>3</td><td>Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are detailed and appropriate. The answer is clear with appropriate use of terminology.</td><td>5–6</td></tr> <tr> <td>2</td><td>Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are relevant but detail is lacking. The answer lacks clarity in places. OR description of procedure or findings at level 3.</td><td>3–4</td></tr> <tr> <td>1</td><td>Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are very limited. The answer is vague/muddled. OR description of procedure or findings at level 2.</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	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are detailed and appropriate. The answer is clear with appropriate use of terminology.	5–6	2	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are relevant but detail is lacking. The answer lacks clarity in places. OR description of procedure or findings at level 3.	3–4	1	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are very limited. The answer is vague/muddled. OR description of procedure or findings at level 2.	1–2	0	No creditable content.	0	6 AO1 = 6
Level	Description	Marks															
3	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are detailed and appropriate. The answer is clear with appropriate use of terminology.	5–6															
2	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are relevant but detail is lacking. The answer lacks clarity in places. OR description of procedure or findings at level 3.	3–4															
1	Description of procedure and findings of a study that investigates Piaget's theory of cognitive development are very limited. The answer is vague/muddled. OR description of procedure or findings at level 2.	1–2															
0	No creditable content.	0															

Question	Marking Guidance	Total Marks
10	Describe and evaluate research into the role of the mirror neuron system in social cognition. Possible content • Mirror neurons are nerve cells that fire when an animal/person performs an action or observes/hears/sees the same action being performed by another animal/person. • They appear to play a role in several areas of social cognition, including action, understanding, empathy, communication, and imitation. • The neural ‘mirroring’ action could enable the observer to identify the intention of the other carrying out the action. When we see someone carry out an action, eg drink water, our mirror neurons are activated as though we had drunk the water. • Scans have shown that observing someone in pain activates the same brain systems as if we were personally in pain, which is the foundation of empathy. • Research has shown that the mirror neuron system in humans is less activated in people low in empathy, or autistic people. • Description of studies, eg Di Pellegrino et al (1992) and Rizzolatti et al (1996). Possible evaluation • Research into mirror neurons suggests a biological explanation for autism and may lead to a greater understanding of social deficits in Autism Spectrum Disorder. • Social cognition is too complex to be explained simply by mirror neurons. • The explanation based on mirror neurons is reductionist, reducing social cognition to a low-level explanation (brain) rather than behavioural/family/social levels. • Research using fMRI scanning has shown differences in mirror neurons of typically developing and autistic children, eg Dapretto et al (2006). • Research has been carried out using animals (macaque monkeys) and there is a problem with extrapolation. Research can be used to support/refute the role of the mirror neuron in social cognition: Gazzola et al (2006); Oberman et al (2005); Dinstein et al (2010); Heyes (2012); Hadjikhani (2007); Haker et al (2012), etc. Credit other relevant material.	12 AO1 = 6 AO3 = 6

	Level	Description	Marks	
	4	Knowledge of research into the role of the mirror neuron system in social cognition 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.	10–12	
	3	Knowledge of research into the role of the mirror neuron system in social cognition is evident but there are occasional inaccuracies/omissions. There is some effective evaluation. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is mostly used appropriately.	7–9	
	2	Limited knowledge of research into the role of the mirror neuron system in social cognition is present. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately.	4–6	
	1	Knowledge of research into the role of the mirror neuron system in social cognition 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.	1–3	
	0	No creditable content.	0	

Section C: Research Methods 1

Total for this section: 30 marks

	Studies have shown that estimates of the speed of vehicles involved in accidents were higher when the participants were asked questions with words that suggested a fast speed rather than a slow speed. A researcher used a sample of 30 university students. The students watched a video of an accident between a car and a bus. They were then asked six questions about the accident. The critical question asked the students to estimate the speed of the car. The answers to the other five questions were not used for analysis. The researcher did not obtain fully informed consent. The students were randomly allocated into one of two conditions: Condition 1: The students were asked: “What speed do you think the car was going when it touched the bus?” Condition 2: The students were asked: “What speed do you think the car was going when it crashed into the bus?”	
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Question	Marking Guidance	Total Marks
11	Briefly explain the difference between an aim and a hypothesis. Award marks as follows: 2 marks for a clear and explicit difference between an aim and a hypothesis. 1 mark for a muddled or vaguely explained difference between an aim and a hypothesis. Possible content - An aim refers to the broader study question, whereas the hypothesis is a specific prediction about the outcome of an investigation. - The aim is derived from a theory while the hypothesis is derived from the aim.	2 AO3 = 2

Question	Marking Guidance	Total Marks
12	What type of variable is the estimate of the speed of the car? Answer key: B – Dependent variable	1 AO2 = 1

Question	Marking Guidance	Total Marks												
13	Explain why the researcher could not gain fully informed consent from the students in this study. Possible content - Fully informed consent would decrease the (internal) validity of the speed estimates. - For fully informed consent, the researcher would have to explain to the students the aim of the study, which was to measure whether the speed estimate is affected by the intensity of the word used. - Knowledge of the aim would increase the chance of demand characteristics, eg it is possible that the students would have changed their answer and exaggerated their speed estimate in the crashed condition in order to please the researcher. - The speed estimates might not have represented the real estimates the students would have given if they had been unaffected by demand characteristics. <table border="1"> <thead> <tr> <th>Level</th><th>Description</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>2</td><td>Explanation of why the researcher was unable to gain fully informed consent is described in some detail. The answer is clear with appropriate use of specialist terminology.</td><td>3–4</td></tr> <tr> <td>1</td><td>Explanation of why the researcher was unable to gain fully informed consent 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>0</td></tr> </tbody> </table>	Level	Description	Marks	2	Explanation of why the researcher was unable to gain fully informed consent is described in some detail. The answer is clear with appropriate use of specialist terminology.	3–4	1	Explanation of why the researcher was unable to gain fully informed consent lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2	0	No creditable content.	0	4 AO2 = 4
Level	Description	Marks												
2	Explanation of why the researcher was unable to gain fully informed consent is described in some detail. The answer is clear with appropriate use of specialist terminology.	3–4												
1	Explanation of why the researcher was unable to gain fully informed consent lacks detail. The answer lacks clarity. Use of specialist terminology is sometimes inappropriate.	1–2												
0	No creditable content.	0												

Question	Marking Guidance	Total Marks
14	Apart from informed consent, briefly explain one other ethical issue the researcher needed to consider for this study. Award marks as follows: 2 marks for a clear explanation of an ethical issue applied to this study. 1 mark for a muddled or vague explanation of an ethical issue. Possible content • There is a danger of harm to the students since they are unable to fully understand all aspects of the study (protection from harm). • Not telling the students about the different conditions ‘touched’ and ‘crashed’, the true aim has been withheld. This increases the risk of harm (deception). Credit other relevant content. No credit for simply naming an ethical issue.	2 AO2 = 2

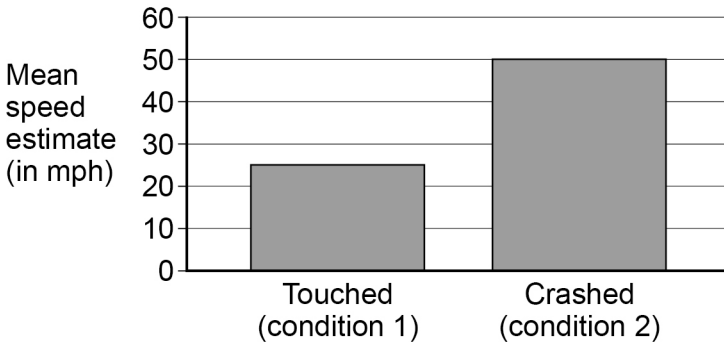
Question	Marking Guidance	Total Marks
15	The researcher used a directional hypothesis. Explain why a directional hypothesis was appropriate. Award marks as follows: 2 marks for a clear explanation of why a directional hypothesis was appropriate. 1 mark for a muddled or vague explanation. Content Previous studies indicated the direction of the results. The researcher could expect that the verb ‘crashed’, which suggested a greater impact would lead to a higher speed estimate (than the word ‘touched’).	2 AO2 = 2

Question	Marking Guidance	Total Marks
16.1	Explain one reason why the researcher randomly allocated the students to the two conditions. Award marks as follows: 3 marks: The explanation of why the researcher used random allocation is detailed. The answer is clear with appropriate use of specialist terminology. 2 marks: The explanation of why the researcher used random allocation lacks detail. The answer lacks clarity in places. 1 mark: The explanation of why the researcher used random allocation is briefly presented. The answer is very limited/vague/muddled. Possible content • It avoids bias. Random allocation makes it more likely that the participants will be equally distributed across the two conditions which reduces the chance of individual differences. • It reduces the possibility of researcher bias as the researcher cannot determine which students complete which condition. This increases the internal validity. If more than one reason included, credit the best one.	3 AO2 = 3

Question	Marking Guidance	Total Marks
16.2	Explain how the researcher could have randomly allocated the students to the two conditions. Award marks as follows: 1 mark for each of the following points, up to a maximum of 4 marks. Content Lottery method/'names from a hat' method • Each student is given a number that is written on a piece of paper. • The numbers are entered into a lottery/hat. • The researcher randomly selects one piece of paper at a time from the container, and places it into either condition, alternating between the two conditions. • This process is repeated until all pieces of paper have been allocated. OR Computer method • Each student is given a number. • The numbers are entered into a random number generator. • The research instructs the computer programme to allocate 15 numbers to each condition. • The computer programme presents a list of numbers that relate to 15 students for condition 1, and another 15 students for condition 2.	4 AO2 = 4

Question	Marking Guidance	Total Marks
17	With reference to demand characteristics, explain why the researcher included the five other questions which were not relevant to this study. Award marks as follows: 3 marks: The explanation of why the researcher included the five other questions is detailed. The answer is clear with appropriate use of specialist terminology. 2 marks: The explanation of why the researcher included the five other questions lacks detail. The answer lacks clarity in places. 1 mark: The explanation of why the researcher included the five other questions is briefly presented. The answer is very limited/vague/muddled. Possible content • The five other questions are distractor questions as they remove the focus from the critical question. • They are included in order to make the aim of the investigation, which is to measure the effect of the wording of the question, less obvious. • This helps to increase the (internal) validity of the results as students are less likely to change their answer in order to please the researcher. • Including the extra questions is supposed to decrease demand characteristics.	3 AO2 = 3

	The researcher analysed the answers to the critical question about the speed of the car and showed the mean estimates in Table 1. Table 1 Mean speed estimates in miles per hour (mph) for 'touched' (condition 1) and 'crashed' (condition 2) <table border="1" data-bbox="296 450 1324 618"> <tr> <th></th><th>Touched (condition 1)</th><th>Crashed (condition 2)</th></tr> <tr> <th>Mean speed estimate (mph)</th><td>25</td><td>50</td></tr> </table>		Touched (condition 1)	Crashed (condition 2)	Mean speed estimate (mph)	25	50	
	Touched (condition 1)	Crashed (condition 2)						
Mean speed estimate (mph)	25	50						

Question	Marking Guidance	Total Marks
18	Using the speed estimates from Table 1, draw an appropriate graph to display the data. You should include a title and label your graph appropriately. Award marks as follows: 1 mark for a title with fully operationalised variables, eg a bar graph showing the mean speed estimate (in mph) for touched and crashed. 1 mark for labelling the Y axis: mean speed estimate (in mph), must start at 0. 1 mark for labelling the X axis: touched (condition 1), crashed (condition 2). 1 mark for correctly drawing the graph. Bars must not touch. Bar graph showing the mean speed estimate (mph) for touched and crashed 	4 AO2 = 4

Question	Marking Guidance	Total Marks
19	The researcher calculated the mean speed estimates. Briefly explain one limitation of using the mean as a measure of central tendency. Award marks as follows: 2 marks for a clear explanation of one limitation of using the mean. 1 mark for a muddled or vague explanation of one limitation of using the mean. Possible content • The mean may be less representative of the whole data set, as it is easily distorted by extreme scores. • The mean does not necessarily represent direct measurements. If more than one limitation included, credit the best one.	2 AO3 = 2

Question	Marking Guidance	Total Marks
20	The sample of students consisted of 18 female and 12 male students. Calculate the percentage of male students in the sample. Show your workings. 2 marks: 40% of students are male. 1 mark: A correct step for the male sample even though the result is incorrect. Step 1: $\frac{12}{30} = 0.4$ Step 2: $0.4 \times 100 = 40\%$ OR Step 1: $12 \times 100 = 1200$ Step 2: $\frac{1200}{30} = 40\%$ Answer: 40% of students are male.	2 AO2 = 2

Question	Marking Guidance	Total Marks
21	Name the method used in this study. Award 1 mark for experimental method or laboratory experiment.	1 AO2 = 1

PS02 grid

	AO1	AO2	AO3	Total
Section A				
01	3			3
02	3			3
03	4			4
04	8	4	8	20
Section B				
05	1			1
06	2			2
07	3			3
08		6		6
09	6			6
10	6		6	12
Section C				
11			2	2
12		1		1
13		4		4
14		2		2
15		2		2
16.1		3		3
16.2		4		4
17		3		3
18		4		4
19			2	2
20		2		2
21		1		1
Unit total	36	36	18	90