Mark Scheme (Results)

January 2025

Pearson Edexcel International Advanced Subsidiary Level in Psychology (WPS02) Paper 01 Biological Psychology, Learning Theories and Development

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Section A

Question Number	Answer	Mark
1(a)	**AO1 (2 marks)** Credit **one** mark for each accurate statement of areas of the brain. For example: • Pre-frontal cortex (1). • Amygdala (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
1(b)	**AO1 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a strength (AO1) Credit **one** mark for justification/exemplification of the strength (AO3) For example: • Zhu et al. (2019) found those who are aggressive have different brains in terms of grey matter, which gives brain functioning as an explanation of aggression credibility (1), as they found that proactive aggression was positively correlated with the density of grey matter in the pre-frontal cortex (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	**Mark**
2(a)	**AO2 (2 marks)** Credit **two** marks for a fully operationalised two-tailed hypothesis. Credit **one** mark for a partially operationalised two-tailed hypothesis. For example: • There will be a relationship between the average number of hours spent exercising a week and the average number of hours slept per night (2). • There will be a relationship between exercise and sleep (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
2(b)	**AO2 (4 marks)** For example: Credit **one** mark for a correct calculation of **total for d^2 = 5.5** Credit **one** mark for a correct calculation of **6 times the sum of d^2 = 33** Credit **one** mark for a correct calculation of **6 times the sum of d^2 divided by n(n²-1) = 0.275** Credit **one** mark for a correct answer to **three decimal places = 0.725**	**(4)**

Average number of hours spent on exercise per week	Rank 1	Average number of hours slept per night	Rank 2	d	d^2
7	4	9	5	**-1**	**1**
3	2	7	3	**-1**	**1**
10	5	8	4	**1**	**1**
5	3	6	1.5	**1.5**	**2.25**
1	1	6	1.5	**-0.5**	**0.25**
				Total for d^2	**5.5**

Look for other reasonable marking points.

Question Number	Answer	Mark
2(c)	**AO2 (1 mark)** Credit **one** mark for accurate identification of the critical value. For example: • 1.000 (1). **Look for other reasonable marking points.**	**(1)**

Question Number	Answer	Mark
2(d)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a weakness in relation to the scenario (AO2). Credit **one** mark for justification/exemplification of the weakness (AO3). For example: • Loreen's participants may have lied about the amount of exercise they did in a week to make themselves look better (1), which reduces the validity of her investigation as she is not accurately measuring the relationship between exercise and sleep (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
3(a)	**AO1 (4 marks)** Credit up to **four** marks for an accurate description. For example: • Brendgen et al. (2005) gathered 234 pairs of twins all aged 6 years old from the Quebec twin register (1). Teachers were given a Preschool Social Behaviour Scale and direct and indirect Aggression Scales to measure the twins' social and physical aggression (1). The twins' peers were given booklets that contained photographs of the different pairs of twins and had to circle three of the photographs that best fitted a descriptor (1). An example of a descriptor for social aggression was 'tells others not to play with a child' (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
3(b)	**AO1 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a strength (AO1) Credit **one** mark for justification/exemplification of the strength (AO3) For example: • Brendgen et al. (2005) conducted their study in the spring of the school year so the teachers and the peers knew the children better (1), which increases the validity of the study as the answers to the questionnaires were based on knowledge of the twins rather than guessing because some were not known to the teachers or peers (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
3(c)	**AO1 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of an improvement (AO1) Credit **one** mark for justification/exemplification of the improvement (AO3) For example: • Brendgen et al. (2005) could have had a more diverse sample which included a larger age range such as up to 10 years old (1), as by then social aggression should have fully developed, so making the results on social aggression more valid (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
4 (a)	**AO1 (3 marks)** Credit up to **three** marks for an accurate description. For example: • Before the scan the participant is injected with glucose that contains an actual radioactive tracer (1). Whilst waiting for the tracer to break down the participants will conduct an activity such as a continuous performance task (CPT) (1). The participant is put into the scanner, which measures which areas of the brain were most active when the participant did the task (1). **Look for other reasonable marking points.**	**(3)**

Question Number	Answer	Mark
4 (b)	**AO1 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a weakness (AO1) Credit **one** mark for justification/exemplification of the weakness (AO3) For example: • People have to interpret the computer image of the scan which can lead to subjectivity (1), which may cause bias as they have to make a judgement about the difference in colours to determine which areas of the brain are more active when someone is feeling aggressive (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Indicative content	Mark
5	**AO1 (4 marks), AO2 (4 marks)** **AO1** • Excess testosterone in the womb can affect the development of the brain, such as the amygdala, which can lead to an increase in aggression. • Testosterone in males during puberty can lead to an increase in aggression, especially in competitive aggression. • Low levels of cortisol lead to an under aroused autonomic nervous system, so aggression may be a way to increase arousal. • Cortisol helps to regulate testosterone levels so low levels of cortisol can lead to high levels of testosterone which can increase aggression. **AO2** • Remo may have more neurons in his amygdala due to excess testosterone whilst he was a foetus which may explain why he shouted at a customer and lost his job. • As he is nineteen years old Remo, he is more competitive which explains why he fought with the supporters of the opposing football team. • Remo's autonomic nervous system is under aroused so he threw his drink at a waiter in order to increase his cortisol and level of arousal. • Due to low levels of cortisol Remo has higher levels of testosterone which means he is more aggressive towards his parents and shouts at them when they are talking to him. **Look for other reasonable marking points.**	**(8)**

Level	Mark	Descriptor
		AO1 (4 marks), AO2 (4 marks) **Candidates must demonstrate an equal emphasis between knowledge and understanding vs application in their answer.**
	0	No rewardable material
Level 1	1–2 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) Provides little or no reference to relevant evidence from the context (scientific ideas, processes, techniques and procedures). (AO2)
Level 2	3–4 Marks	Demonstrates mostly accurate knowledge and understanding. (AO1) Discussion is partially developed, but is imbalanced or superficial occasionally supported through the application of relevant evidence from the context (scientific ideas, processes, techniques and procedures). (AO2)
Level 3	5–6 Marks	Demonstrates accurate knowledge and understanding. (AO1) Arguments developed using mostly coherent chains of reasoning. Candidates will demonstrate a grasp of competing arguments but discussion may be imbalanced or contain superficial material supported by applying relevant evidence from the context (scientific ideas, processes, techniques and procedures (AO2)
Level 4	7–8 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) Displays a well-developed and logical balanced discussion, containing logical chains of reasoning. Demonstrates a thorough awareness of competing arguments supported throughout by sustained application of relevant evidence from the context (scientific ideas, processes, techniques or procedures). (AO2)

Section B

Question Number	Answer	Mark
6 (a)	**AO1 (1 mark)** Credit **one** mark for an accurate definition For example: • Vicarious reinforcement is when you see a model being given something you desire for their behaviour so you want to imitate that behaviour (1). **Look for other reasonable marking points.**	**(1)**

Question Number	Answer	Mark
6 (b)	**AO1 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of one strength and one weakness (AO1). Credit **one** mark for justification/exemplification of the strength and the weakness (AO3). For example: Strength • Bandura Ross and Ross (1961) found that children did imitate an adult's aggressive behaviour toward a Bobo doll giving the theory credibility (1), as they found 50.9 imitative acts when the children saw an aggressive role model compared to 4.2 when they saw a non-aggressive role model (1). Weakness • One weakness of social learning theory is that it ignores the effects of biological factors on human behaviours, such as brain functioning (1), which says that stimulation of the amygdala causes aggression, so social learning theory is not a complete explanation of human behaviour (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
7 (a)	**AO2 (4 marks)** Credit up to **four** marks for an accurate description in relation to the scenario. For example: • Anya should decide what types of behaviour she is going to observe such as the number of boys or girls who play on each piece of equipment, such as the slide (1). She should create a tally chart to take with her to the park so she could mark down every time she saw a child play on the swing (1). Anya should sit where the children could not see her when she observed the behaviour of the children in the park (1). Anya could also note down qualitative data, such as what the children were saying to each other as they played in the park (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
7 (b)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of one strength in relation to the scenario (AO2). Credit **one** mark for an accurate justification/exemplification of the strength (AO3). For example: • The children in the park would not know their behaviour was being observed so this increases the validity of Anya's observation (1), as the children would play naturally on the equipment and not change their behaviours when in the park so it avoids demand characteristics (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
8 (a)	**AO2 (1 mark)** Credit **one** mark for accurate statement in relation to quantitative data from the learning theories and development practical. For example: • We concluded that females are more likely than males to help a person who has dropped a book (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Must relate to learning theories and development practical (observation).**	**(1)**

Question Number	Answer	Mark
8 (b)	**AO2 (2 marks)** Credit up to **two** marks for an accurate description in relation to the qualitative data from the learning theories and development practical. For example: • We read through our notes on what the males and females had said to the person who dropped the book (1), we then created themes such as asking if the person who dropped the book was alright based on what we had read (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Must relate to learning theories and development practical (observation).**	**(2)**

Question Number	Answer	Mark
8 (c)	**AO2 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of each improvement in relation to the learning theories and development practical (AO2). Credit **one** mark for justification/exemplification of each improvement (AO3). For example: - We could have used a number of different libraries to observe whether participants helped to pick up a book, or not (1), as this would make our results on whether males or female helped more representative of the target population so they would be more generalisable (1). - We could have had both a male and a female drop a book in the library to improve the validity of our practical investigation (1), so we could be sure that the extraneous variable of the gender of who dropped the book did not affect our results (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Must relate to learning theories and development practical (observation).**	**(4)**

Question Number	Answer	Mark
9 (a)	**AO2 (1 mark)** Credit **one** mark for the correct answer For example: • 8 (1). **Reject all other answers**	**(1)**

Question Number	Answer	Mark
9 (b)	**AO2 (1 mark)** Credit **one** mark for the correct answer For example: • 1 (1). **Reject all other answers**	**(1)**

Question Number	Answer	Mark
9 (c)	**AO2 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of a strength and a weakness in relation to the scenario (AO2). Credit **one** mark for justification/exemplification of the strength and the weakness (AO3). For example: Strength • The mean uses all the scores from each dog that did or did not get a treat when finding drugs in a bag (1), so it is a more robust measure of central tendency when using the means to compare the data between the dogs (1). Weakness • The mean can be affected by extreme scores such as the dog who only found drugs once in condition A (1), so it may not accurately represent the scores of the majority of the dogs who were given a treat unlike the median (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
9 (d)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a reason in relation to the scenario (AO2). Credit **one** mark for justification/exemplification of the reason (AO3). For example: • Dogs and humans have a similar brain, so the results about the use of treats as a positive reinforcement can be generalised to humans (1), as if the dogs learn a behaviour such as finding drugs because they were given treats then we can apply this to humans who will also learn behaviours if given treats (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Indicative content	Mark
10	**AO1 (4 marks), AO3 (4 marks)** **AO1** • Objects relations therapy believes that our current relationships are affected by past relationships with significant others, such as our parents. • Our childhood relationships unconsciously determine how we behave in our current relationships, and what we will feel is acceptable behaviour from others in our current relationships. • Object relations therapy aims to give clients insights into their current relationship problems by bringing the unconscious ideas we have about relationships into the conscious. • The client has to trust the therapist so that they feel comfortable when talking about past relationships and safe when dealing with unconscious conflicts. **AO3** • If a client lacks motivation to engage in therapy, for example if they have depression, then objects relation therapy may not be effective as it requires the client to engage with the process. • As object relations therapy looks for the unconscious causes of behaviour it gets to the root cause of the issue so it should be more effective than other treatments such as drugs that only treat the symptoms. • Object relations therapy can take a long time to cure the client so it will not be effective for clients that need help quickly, such as those who have addictions. • Objects relations therapy does not have serious side effects, unlike the use of drugs, which may mean clients are more willing to complete the therapy. **Look for other reasonable marking points.**	**(8)**

Level	Mark	Descriptor
		AO1 (4 marks), AO3 (4 marks) **Candidates must demonstrate an equal emphasis between knowledge and understanding vs evaluation/conclusion in their answer.**
	0	No rewardable material.
Level 1	1-2 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) A conclusion may be presented, but will be generic and the supporting evidence will be limited. Limited attempt to address the question. (AO3)
Level 2	3-4 Marks	Demonstrates mostly accurate knowledge and understanding. (AO1) Candidates will produce statements with some development in the form of mostly accurate and relevant factual material, leading to a superficial conclusion being made. (AO3)
Level 3	5-6 Marks	Demonstrates accurate knowledge and understanding. (AO1) Arguments developed using mostly coherent chains of reasoning leading to a conclusion being presented. Candidates will demonstrate a grasp of competing arguments but evaluation may be imbalanced. (AO3)
Level 4	7-8 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) Displays a well-developed and logical evaluation, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments, presenting a balanced conclusion. (AO3)

Section C

Question Number	Indicative content	Mark
11	**AO1 (6 marks), AO3 (6 marks)**	**(12)**

AO1

McDermott (2008).

- The aim of the study was to see if genes made it more likely that participants would engage in aggressive behaviour that has a cost.
- 78 males were genes tested and split into two groups, MAOA-H or MAOA-L.
- Participants played a power to take game, where they made earnings that an unseen opponent could take and the participant could choose to punish the opponent with hot sauce.
- The participants who had 80% of their earnings taken administered more hot sauce than participants who had 20% of their earnings taken.
- MAOA-L gave more hot sauce to their opponents in both conditions compared to MAOA-H.
- They concluded that genes do play a role in aggression when provoked by environmental factors.

Hoefelmann et al. (2006).

- The aim of the study was to see if the lifestyle of students affected their quality of sleep.
- 989 students from Brazil aged 14 to 24 years old filled out a questionnaire on sleep and lifestyle twice, one nine months after the other.
- The questions were about sleep quality and duration and lifestyle factors such as how often they exercised, and how often they watched television.
- They found that students who often ate snacks and watched a lot of television and did not do endurance exercise were less likely to say they did not get enough sleep.
- The number of students who said they did not get enough sleep or had poor quality of sleep remained the same over the nine months the study was conducted.
- They concluded that the perceived quality and duration of sleep remained stable over time.

AO3

McDermott (2008).

- The study did not use females so it cannot be said that MAOA-L in females would result in increased aggression due to environmental factors.
- The procedure was standardised with each participant earning the same amount in total throughout the entire game so it can be replicated to ensure consistency of results increasing reliability.
- The participants were deceived as they thought they were playing against another human being not a computer which decreases the ethics of the study.
- McDermott justified the deception as participants behave differently if they know they are playing a computer, so the deception was needed to increase the validity of the experiment.

- The results are objective, the participant either gave their opponent hot sauce or did not give them hot sauce so researcher bias about what is aggressive behaviour is minimised.
- In real life we often see the person we are aggressive towards so it could be argued that the results of this study are not realistic as the participants did not see their opponent have the hot sauce, so reducing validity.

Hoefelmann et al. (2006).
- The study only used Brazilian students so the results on sleep quality and lifestyle factors may not be true for other people, such as those who have jobs.
- The procedure was standardised, all participants had the same questionnaires both times they were asked so it can be replicated to ensure consistency, increasing reliability.
- The quality and duration of sleep were self-reported by the students so their answers may not have been accurate, possibly due to social desirability, which affects the validity of the study.
- The questionnaire on lifestyle factors included closed answer questions so the data was objective meaning researcher bias when analysing the results was minimised increasing reliability.
- More than 50% of the original 2000 participants did not complete the follow up questionnaire which may have affected the credibility of the results, as those who developed sleep issues may have dropped out.
- The study was ethical as the students had the right to withdraw, shown by the fact that over 50% of the original participants did not complete the questionnaire given nine months later.

Look for other reasonable marking points.

Level	Mark	Descriptor
		AO1 (6 marks), AO3 (6 marks) **Candidates must demonstrate an equal emphasis between knowledge and understanding vs evaluation/conclusion in their answer.**
	0	No rewardable material.
Level 1	1-3 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) A conclusion may be presented, but will be generic and the supporting evidence will be limited. Limited attempt to address the question. (AO3)
Level 2	4-6 Marks	Demonstrates mostly accurate knowledge and understanding. (AO1) Candidates will produce statements with some development in the form of mostly accurate and relevant factual material, leading to a superficial conclusion being made. (AO3)
Level 3	7-9 Marks	Demonstrates accurate knowledge and understanding. (AO1) Arguments developed using mostly coherent chains of reasoning leading to a conclusion being presented. Candidates will demonstrate a grasp of competing arguments but evaluation may be imbalanced. (AO3)
Level 4	10-12 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) Displays a well-developed and logical evaluation, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments, presenting a balanced conclusion. (AO3)

Question Number	Indicative content	Mark
12	**AO1 (6 marks), AO2 (4 marks), AO3 (6 marks)** **AO1** • The XYY genome is said to make people more aggressive as they lack empathy so do not understand the consequences of their actions. • The MAOA gene controls the breakdown of monoamines such as serotonin, people with MAOA-L have excess monoamines as they are not broken down. • When serotonin is low, it affects our moods and may make us aggressive. • Freud said that our behaviour is driven by unconscious motives, often from unresolved childhood issues, which can include being aggressive. • If the Oedipus conflict is not resolved in males, then the young boy may continue to see his father as a threat, and this unconscious fear of the father may lead to aggression towards other males who remind the adult of their father. • If one of Freud's psychosexual stages is not successfully resolved then this can have an impact on the behaviour of the adult as they are fixated at a stage. **AO2** • Benjamin did not understand how shouting at his partner and smashing the television makes them feel, so he continues to shout at them when asked to do household chores. • Benjamin may have MAOA-L which would explain why he was aggressive towards his captain as excess serotonin affected his mood and made him more aggressive. • Benjamin may have shouted at his captain as the captain reminded him of his father, so Benjamin expresses his unconscious fear of his father as aggression towards the captain. • Benjamin may be fixated in the anal stage, and have an anally expulsive personality as he is untidy at home, leaving his belongings lying around. **AO3** • Bruner et al. (1993) found that the males in a family that had a mutated MAOA gene were not able to regulate their impulsive behaviour so Benjamin's aggression may be due to a defective MAOA gene. • The MAOA explanation ignores the role of nurture on human aggression, it could be factors such as family life that cause aggression, so it is not a complete explanation of aggression. • Ouellet-Morin et al. (2016) found that males with MAOA-L were more likely to be antisocial when exposed to violence compared to males with MAOA-H showing genes can affect our aggression. • Freud's theory can be said to lack credibility as it is hard to measure concepts such as the unconscious due to the concepts being abstract ideas, so it may not explain Benjamin's behaviour. • Little Hans (1909) was afraid of horses which he unconsciously associated with fear of his father, showing we do go through Freud's stages of psychosexual development; therefore, they do affect our behaviour.	**(16)**

- Freud's psychosexual stages stop at adolescence unlike Erikson whose stages of development go through to the end of adulthood, therefore, Freud's theory may not be able to effectively explain behaviour in adults.

Look for other reasonable marking points.

Level	Mark	Descriptor
		AO1 (6 marks), AO2 (4 marks), AO3 (6 marks) **Candidates must demonstrate an equal emphasis between knowledge and understanding vs judgement/conclusion in their answer.** **Application to the scenario is capped at maximum 4 marks.**
	0	No rewardable material.
Level 1	1–4 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) Provides little or no reference to relevant evidence from the context (scientific ideas, processes, techniques and procedures). (AO2) A judgement/decision may be presented, but will be generic and the supporting evidence will be limited. Limited attempt to address the question. (AO3)
Level 2	5–8 Marks	Demonstrates mostly accurate knowledge and understanding. (AO1) Line(s) of argument occasionally supported through the application of relevant evidence from the context (scientific ideas, processes, techniques and procedures). (AO2) Candidates will produce statements with some development in the form of mostly accurate and relevant factual material leading to a judgement/decision being presented. Candidates will demonstrate a grasp of competing arguments but response may be imbalanced. (AO3)
Level 3	9–12 Marks	Demonstrates accurate knowledge and understanding. (AO1) Line(s) of argument supported by applying relevant evidence from the context (scientific ideas, processes, techniques and procedures). Might demonstrate the ability to integrate and synthesise relevant knowledge. (AO2) Displays a mostly developed and logical argument, containing mostly coherent chains of reasoning. Demonstrates an awareness of competing arguments, presenting a judgement/decision which may be imbalanced. (AO3)
Level 4	13–16 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) Line(s) of argument supported throughout by sustained application of relevant evidence from the context (scientific ideas, processes, techniques or procedures). Demonstrates the ability to integrate and synthesise relevant knowledge. (AO2) Displays a well-developed and logical argument, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments and presents a balanced response, leading to a balanced judgement/decision. (AO3)