Mark Scheme (Results)

January 2024

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

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General Marking Guidance

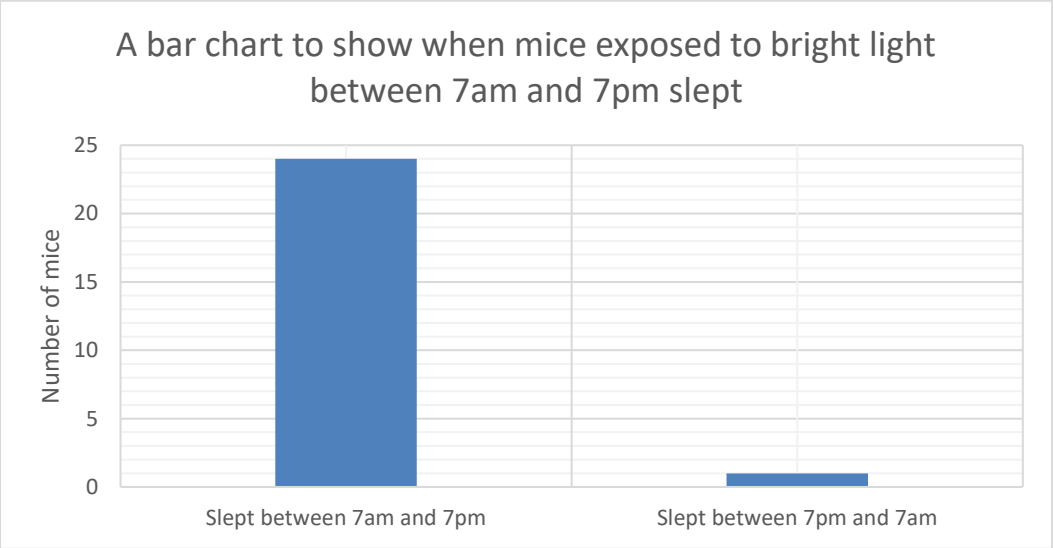
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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 (1 mark) Credit one mark for accurate statement of a conclusion. For example: • Raine et al. (1997) concluded that murderers who pleaded not guilty by reasons of insanity did have differences in glucose metabolism in selected brain areas. (1) Look for other reasonable marking points.	(1)

Question Number	Answer	Mark
1(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: • Raine et al. (1997) only used murderers who pleaded not guilty by reasons of insanity which is a biased sample (1), as the brain differences found may not be representative of the brain functioning in murderers who did not plead insanity (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
2(a)	AO2 (1 mark) Credit one mark for an accurate identification of the independent variable. For example: • Whether the mice were exposed to bright light between 7am and 7pm or between 7pm and 7am (1). Look for other reasonable marking points. Generic answers score 0 marks.	(1)

Question Number	Answer	Mark
2(b)	AO2 (3 marks) Credit one mark for an accurate title. Credit one mark for accurate labelling of the axes Credit one mark for accurate plotting of the data. For example:  Look for other reasonable marking points.	(3)

Question Number	Answer	Mark
2(c)	AO2 (1 mark), AO3 (1 mark) Credit one mark for accurate use of the data in relation to the scenario (AO2) Credit one mark for an accurate conclusion (AO3) For example: • Sienna could conclude that when mice are exposed to bright light, it does affect the time that they sleep (1) as only 5 mice slept in the dark when they were exposed to bright light between 7pm and 7am which is 15 more than the mice who were not exposed to bright light during this time (1). Look for other reasonable marking points. Generic answers score 0 marks.	(2)

Question Number	Answer	Mark
2(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: • Sienna used mice instead of human participants as it would have been unethical to expose humans to bright light in order to change their sleeping patterns (1). It is more ethical to use mice rather than humans due to protection from harm where humans should leave the experiment in the same state as they entered it (1). Look for other reasonable marking points. Generic answers score 0 marks.	(2)

Question Number	Answer	Mark
3(a)	AO1 (3 marks) Credit up to three marks for an accurate description. For example: • Exposure to testosterone whilst in the womb affects the development of the brain and can affect the areas associated with aggression such as the amygdala (1). When males enter puberty, they release more testosterone which increases their competitive responses and so can increase aggression (1). Those with low levels of cortisol may become more aggressive to increase arousal and so increase their levels of cortisol (1). Look for other reasonable marking points.	(3)

Question Number	Answer	Mark
3(b)	AO1 (2 marks), AO3 (2 marks) Credit one mark for accurate identification of a strength and a weakness (AO1) Credit one mark for justification/exemplification of the strength and the weakness (AO3) For example: Strength • Bokhoven et al. (2005) found that there is a relationship between aggressive behaviour and cortisol which gives the theory credibility (1), as they found that boys with aggressive chronic antisocial behaviour had higher levels of cortisol compared to boys who did not have aggressive chronic antisocial behaviour (1). Weakness • A lot of the research on aggression and hormones has been conducted on animals so the results may not be true of aggression in humans weakening the credulity of the theory (1), as humans may have more complex cognitive abilities and can reason why aggression may not be a good strategy (1). Look for other reasonable marking points.	(4)

Question Number	Answer	Mark
4 (a)	AO1 (4 marks) Credit up to four marks for an accurate description. For example: • Light therapy involves sitting in front of a box that produces bright light for about thirty minutes in the morning to simulate sunshine (1). The light box should provide exposure to at least 10 000 lux of light and should be about 41 to 61 centimetres away from the face (1). It works by decreasing the production of melatonin so patients do not feel as tired (1). It increases serotonin levels, a neurotransmitter that affects mood, so that patients should not feel as depressed (1). Look for other reasonable marking points.	(4)

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: • The use of light therapy can cause side effects in some patients, such as headaches or eye strain (1), which means it may not be effective for everyone who has seasonal affective disorder as it could make them feel worse (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
4(c)	AO1 (1 mark), AO3 (1 mark) Credit one mark for accurate identification of one reason (AO1) Credit one mark for justification/exemplification of the reason (AO3) For example: • Light therapy may be more effective than cognitive behavioural therapy for seasonal affective disorder clients may be more likely to engage with light therapy (1), as it does not require the clients to be as motivated because they are not required to leave the house or talk to anyone to access the light therapy (1). Look for other reasonable marking points.	(2)

Question Number	Indicative content	Mark
5	AO1 (4 marks), AO3 (4 marks) AO1 • The amygdala is one area of the brain that processes internal and external stimuli and determines if we react to a situation in an aggressive manner. • Damage to the amygdala can cause people to misinterpret information from our senses so they behave aggressively when this is not an appropriate reaction. • If the hypothalamus is not functioning correctly, they it can lead to excess testosterone being produced, so increasing aggression. • Damage to the prefrontal cortex may lead to an inability to delay gratification of our impulses so can increase aggression to allow impulses to be expressed. AO3 • Brain functioning is a scientific explanation of aggression as it focuses on empirical data, such as areas of the brain that are damaged, so it may be a better explanation than Freud's theory of aggression as thought processes cannot be directly observed. • Brain functioning as an explanation of aggression is reductionist, it ignores the effect of nurture such as learning aggression through the observation of role models so it is not a complete explanation of human aggression. • Lin et al. (2011) found that the ventromedial hypothalamus did play a role in processing information from our senses and motor muscles that underlie aggression so the hypothalamus may be responsible for aggression in humans. • The use of case studies, such as Phineas Gage, are not representative of other people who have brain damage so the results may not be true of all aggression in all humans, reducing the validity of brain functioning as an explanation of human behaviour. 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 assessment/conclusion in their answer.		
	0	No rewardable material.
Level 1	1–2 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) Generic assertions may be presented. 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 generic or superficial assessment being presented. (AO3)
Level 3	5–6 Marks	Demonstrates accurate knowledge and understanding. (AO1) Arguments developed using mostly coherent chains of reasoning leading to an assessment being presented which considers a range of factors. Candidates will demonstrate understanding of competing arguments/factors but unlikely to grasp their significance. The assessment leads to a judgement but this may be imbalanced. (AO3)
Level 4	7–8 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) Displays a well-developed and logical assessment, containing logical chains of reasoning throughout. Demonstrates an awareness of the significance of competing arguments/factors leading to a balanced judgement being presented. (AO3)

Section B

Question Number	Answer	Mark
6 (a)	AO1 (1 mark), AO2 (1 mark) Credit one mark for an accurate definition (AO1). Credit one mark for a suitable example (AO2). For example: • An unconditioned stimulus is an environmental stimulus that causes the innate reflexive response (1). For example food is an unconditioned stimulus as it causes the response of salivation (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
6 (b)	AO1 (1 mark), AO2 (1 mark) Credit one mark for an accurate definition (AO1). Credit one mark for a suitable example (AO2). For example: • A conditioned stimulus was the neutral stimulus but it now elicits the conditioned response (1). In Pavlov's study the metronome became the conditioned stimulus as it caused salivation in the dogs (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
6 (c)	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: • Pavlov's (1927) study of dogs supports classical conditioning as an explanation of learning so the theory is credible as he classically conditioned the dogs (1) as he found that pairing a metronome with the presentation of food lead to the dogs salivating when they heard the metronome (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
7 (a)	AO2 (2 marks) Credit up to two marks for an accurate description in relation to the scenario. For example: • Reece would collect all the names of the boys and girls who attended the school and put them into a random computer generator (1). He would then use the computer to pick the names of the children until he had enough to conduct his observation on the effects of rewards on behaviour of boys and girls (1). Look for other reasonable marking points. Generic answers score 0 marks.	(2)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>7 (b)(i)</td><td>AO2 (4 marks)

For example:

<table>
<tr><th></th><th></th><th>Observed</th><th>Expected</th><th>O-E</th><th>$(O-E)^2$</th><th>$(O-E)^2/E$</th></tr>
<tr><td rowspan="2">Condition A: 1 point or less during the day</td><td>Boys</td><td>3</td><td>6</td><td>-3</td><td>9</td><td>1.5</td></tr>
<tr><td>Girls</td><td>8</td><td>5</td><td>3</td><td>9</td><td>1.8</td></tr>
<tr><td rowspan="2">Condition B: 5 points or more during the day</td><td>Boys</td><td>9</td><td>6</td><td>3</td><td>9</td><td>1.5</td></tr>
<tr><td>Girls</td><td>2</td><td>5</td><td>-3</td><td>9</td><td>1.8</td></tr>
<tr><td colspan="4"></td><td>Chi squared =</td><td>6.6</td></tr>
</table>
Credit one mark for correct completion of O-E column
Credit one mark for accurate completion of $(O-E)^2$ column
Credit one mark for accurate completion of $(O-E)^2/E$ column to one decimal place
Credit one mark for correct chi-squared to one decimal place = 6.6

Look for other reasonable answers.</td><td>(4)</td></tr>
</table>

Question Number	Answer	Mark
7 (b)(ii)	AO2 (1 mark), AO3 (1 mark) Credit one mark for accurate identification of significance in relation to the scenario (AO2). Credit one mark for an accurate justification/exemplification of the decision (AO3). For example: • Reece found a significant difference in the number of boys and girls who received 1 or fewer points and those who received 5 or more points (1) as the calculated value (of 6.6) is bigger than the critical value (of 2.71) (1). Look for other reasonable marking points. Generic answers score 0 marks.	(2)

Question Number	Answer	Mark
7 (c)	AO2 (2 marks), AO3 (2 marks) Credit one mark for accurate identification of each improvement in relation to the scenario (AO2). Credit one mark for justification/exemplification of each improvement (AO3). For example: • Reece could have used a covert observation when observing whether the boys and girls did as the teacher requested to avoid demand characteristics, with the teacher's consent (1), as the children would not be aware that he was observing them so the number of points they received would be more realistic (1). • Reece could have observed the boys and girls and the number of points they got for a longer time period such as a week (1), as this would make the observation more valid because the children's mood would not have as much of an effect over a full week (1). Look for other reasonable answers. Generic answers score 0 marks.	(4)

Question Number	Answer	Mark
8 (a)	AO1 (2 mark) Credit up to two marks for accurate naming. For example: • The oral stage (1). • The anal stage (1). Look for other reasonable marking points.	(2)

Question Number	Answer	Mark
8 (b)	AO2 (4 marks) Credit up to four marks for an accurate description in relation to the scenario. For example: • Patti is in the phallic stage and is going through the Electra complex as she is five years old (1). Patti has unconscious desires for her father which explains why she is clinging to him (1). Her desire to be a nurse is her unconscious desire to be like her father due to penis envy (1). Patti blames her mother for not having a penis which is why she shouts and tells her mother 'no' (1). Look for other reasonable marking points. Generic answers score 0 marks.	(4)

Question Number	Answer	Mark
8 (c)	AO2 (1 mark), AO3 (1 mark1) 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: • Freud's theory can be considered as lacking empirical evidence to support it making it unscientific, as assumptions are made about why Patti always shouts 'no' at her mother (1) as concepts such as the unconscious are not directly observable, so its effects must be inferred such as interpreting the hidden meaning of why Patti shouts 'no' (1). Look for other reasonable marking points. Generic answers score 0 marks.	(2)

Question Number	Indicative content	Mark
9	AO1 (4 marks), AO2 (4 marks) AO1 • Experiments should use the minimum number of animals possible to get valid results according to the Scientific Procedures Act (1986). • Animals can only be used in experiments if the results are likely to have scientific or educational value that justifies the use of animals. • Any pain or distress caused by the experiment should be kept to a minimum and should be avoided if possible, with enrichment being the preferred option. • Caging should be appropriate for the species; it should be large enough and if the species is a social animal they should be housed in groups. AO2 • Igor had a total of 40 pigeons in his experiment, he could have used fewer pigeons and still had valid results. • Teaching pigeons how to play basketball may not have any scientific or educational value so Igor may not get a licence to conduct his experiment. • Igor is not causing pain or distress to the pigeons as they have regular access to food and water, and are being rewarded for playing basketball rather than being punished for not playing it. • Pigeons tend to live in groups so Igor should not put them in individual cages when they are not taking part in the experiment he should house them in groups. 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 C

Question Number	Indicative content	Mark
10	AO1 (4 marks), AO2 (4 marks), AO3 (4 marks) AO1 • Social learning theory says that we observe the actions of our role models and will imitate those actions when a relevant situation presents itself. • People are more likely to be role models if they have a variety of characteristics such as having relevance for those who are observing their behaviour. • Vicarious reinforcement is when the role model is rewarded for their behaviour so making it more likely that the behaviour will be imitated. • Once a behaviour is imitated if it is extrinsically rewarded through receiving something desirable then the behaviour is more likely to be repeated AO2 • Maud regularly watches her hockey team and she has observed how they play, including hitting their opponents on the leg. • The members of the local hockey team have relevance to Maud as she also plays hockey in the school team so she notices how they play. • The local hockey team have started winning matches so they are being rewarded for playing more aggressively which is why Maud imitated their behaviour in her recent school match. • Maud was extrinsically rewarded when she helped the school team win the match as her friends praised her, so if she plays another hockey game, she is more likely to repeat that behaviour. AO3 • Bandura Ross and Ross (1961) found that children imitate aggressive actions and words towards a Bobo doll after seeing an adult being aggressive towards the Bobo doll giving the theory credibility when explaining Maud's hockey playing. • There are other explanations of Maud's aggressive playing, such as she may have suffered a brain injury so social learning theory may not be a complete explanation of her aggression. • Social learning theory is a better explanation of aggression than operant conditioning as it explains how we learn aggression even if we are not rewarded for it so it can explain Maud's aggressive hockey playing. • Feshbach and Singer (1961) found that watching violent television did not increase aggression in boys so Maud's aggressive play may not have been due to watching the local hockey team. Look for other reasonable marking points.	(12)

Level	Mark	Descriptor
AO1 (4 marks), AO2 (4 marks), AO3 (4 marks) Candidates must demonstrate an equal emphasis between knowledge and understanding vs application vs evaluation/conclusion in their answer.		
	0	No rewardable material.
evel 1	1-3 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) Provides little or no reference to relevant evidence from the context (scientific ideas, processes, techniques & procedures). (AO2) 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) Line(s) of argument occasionally supported through the application of relevant evidence from the context (scientific ideas, processes, techniques & procedures). (AO2) 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) Line(s) of argument supported by applying relevant evidence from the context (scientific ideas, processes, techniques & procedures). Might demonstrate the ability to integrate and synthesise relevant knowledge. (AO2) 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) 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 evaluation, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments, presenting a balanced conclusion. (AO3)

Question Number	Indicative content	Mark
11	AO1 (6 marks), AO3 (10 marks) AO1 • Brendgen et al. (2005) aimed to see to what extent social aggression was due to genetics, shared environmental factors or non-shared environmental factors in six-year-old twins. • To test if the same sex twins were monozygotic some twins had their DNA tested, and the others were decided based on how similar they looked at 18 months old. • Teachers completed two questionnaires on the physical aggression of the twins, the pre-school behaviour scale and the direct and indirect aggression scale whilst peers had to circle photographs of the twins that best fit behavioural descriptors. • Watson and Rayner (1920) studied Little Albert, a nine-month-old boy to see if he could be conditioned to become scared of white rats. • At 11 months old Little Albert was conditioned in a laboratory room in the hospital by a hammer hitting a metal bar when a white rat went near him. • It was found that after conditioning Little Albert would cry and move away from the white rat and the response generalised to other white fluffy objects. AO3 • Brendgen et al. (2005) gained the fully informed consent of the parents of the six-year-old twins to conduct their study so it is ethical. • Basing a decision on zygosity on how similar the twin pair looked is not reliable as other researchers may class twins that were originally thought to be monozygotic as dizygotic whilst others may not. • The use of established questionnaires for the teachers' ratings gives the study increased reliability as other researchers could access those questionnaires to replicate the study. • It could have caused the twins distress if their peers told them that they had circled their photographs for negative behavioural descriptors which could be an ethical issue. • The teacher ratings and peer ratings both gathered quantitative data which increases reliability as Brendgen et al. (2005) did not need to interpret the data as it was objective. • As Little Albert's mother worked as a wet nurse at the same hospital there is some debate whether she could have given fully informed consent or whether she felt she had to agree so there may be ethical issues. • Watson and Rayner (1920) used a standardised procedure of the metal bar being hit by a hammer, and recorded how many times this happened increasing the reliability as the study could be replicated.	(16)

	• There could be a lack of reliability in the results as Watson and Rayner (1920) had to determine which behaviours demonstrated that Little Albert was afraid of the white rat. • Watson and Rayner (1920) intentionally caused Little Albert distress through pairing the loud noise with a white rat so the study can be seen as unethical. • It was stated that Watson and Rayner (1920) aimed to decondition Little Albert at the end of the study, so his distress would not have been permanent making the proposed study more ethical. Look for other reasonable marking points.	

Level	Mark	Descriptor
AO1 (6 marks), AO3 (10 marks) Candidates must demonstrate a greater emphasis on evaluation/conclusion vs knowledge and understanding in their answer. Knowledge & understanding is capped at maximum 6 marks.		
	0	No rewardable material.
Level 1	1-4 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	5-8 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	9-12 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	13-16 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)

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