Mark Scheme (Results)

January 2022

Pearson Edexcel International Advance Subsidiary Level in Psychology WPS02 Paper 01: Biological Psychology, Learning Theories and Development

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General Marking Guidance

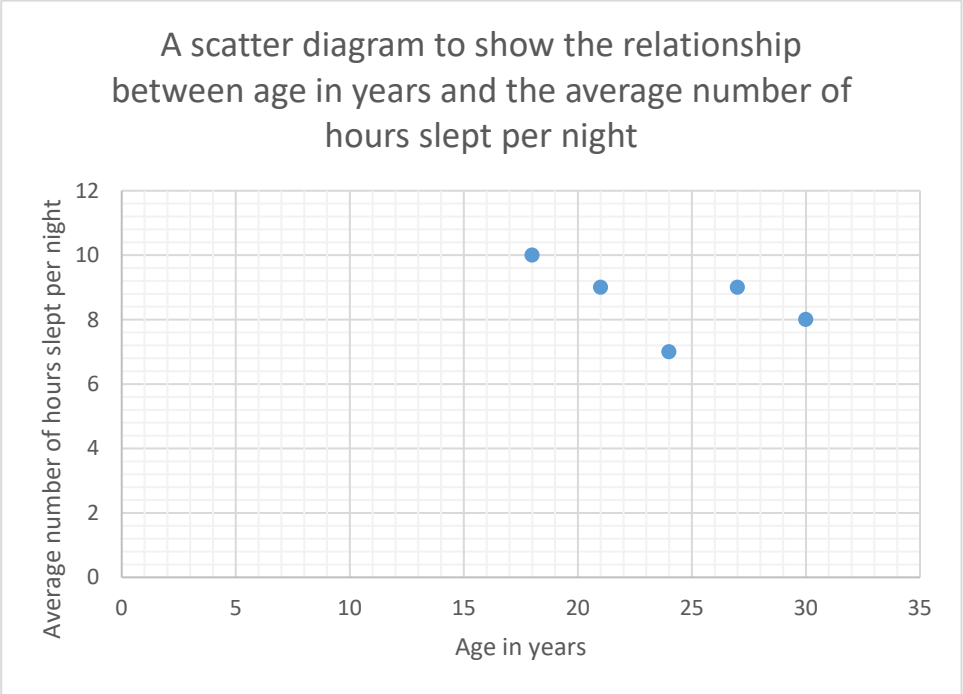
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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
1a	**AO1 (1 mark)** Credit **one** mark for accurate statement. For example: • To pass messages from one neuron to another in the form of chemicals (1). **Look for other reasonable marking points.**	**(1)**

Question Number	Answer	Mark
1b	**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: • It does not explain the effect of external zeitgebers, such as the amount of daylight, on our behaviour (1), as Siffre (1975) found that the absence of external cues affected his sleep wake cycle so neurotransmitters are not the only cause of human behaviour (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	**Mark**
2(a)	**AO2 (2 marks)** Credit **one** mark for accurately stating each fully operationalised covariable in relation to scenario. For example: • The age of the participants in years (1) • The number of hours slept on average in a night (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
2(b)	**AO2 (3 marks)** **One** mark for appropriate title. **One** mark for appropriate labelling of axes. **One** mark for correct plotting of data. For example:  **Look for other reasonable marking points.**	**(3)**

Question Number	Answer	Mark
2(c)	**AO2 (2 marks)** Credit **one** mark for each accurate statement in relation to scenario. For example: • Serenity was looking to see if there was a correlation between age in years and the average number of hours slept per night (1) • The data collected was at least ordinal as age and hours can be ranked in numerical order (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 accurate description For example: • The menstrual cycle lasts about 28 days on average and is regulated by hormones (1). Oestrogen levels are at their highest about half way through the cycle when females ovulate (1). In the second half of the menstrual cycle progesterone levels increase in case the egg is fertilised (1). If the egg does not implant in the womb the progesterone levels decrease and the lining of the womb is shed (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
3(b)	**AO1 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of each strength (AO1) Credit **one** mark for justification/exemplification of each strength (AO3) For example: • Penton-Voak et al. (1999) found that the menstrual cycle can have an effect on the types of male faces women prefer showing infradian rhythms do affect our behaviour (1), as women preferred more masculine face during their most fertile time in the cycle, so the infradian rhythm affects who we find desirable (1). • Dalton (1964) found that pre-menstrual syndrome was associated with an increase in crimes, suicides and accidents which suggests that infradian rhythms affect human behaviour (1) as there was a negative impact on female behaviour at this stage in the cycle so giving the explanation plausibility (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
4 (a)	**AO1 (4 marks)** Credit up to **four** marks for accurate description. For example: McDermott (2008) • McDermott (2008) aimed to see if the difference in applying hot sauce as a punishment were due to the MAOA gene (1). Participants were split into two groups, those with high activity, MAOA-H and those with low activity, MAOA-L (1). They measured how willing the participants were to trade their earnings to punish unseen opponents by administering hot sauce (1). The results showed that the MAOA-L group were more likely to trade their earnings to administer the hot sauce to their opponents when 80% of their earnings had been taken (1). Hoefelmann et al. (2006) • Hoefelmann et al. (2006) aimed to investigate the cross-sectional and prospective associations between behavioural variables and sleep (1). The participants answered questionnaires about physical activity and lifestyle factors, and sleep quality and duration at two different times (1). The results showed that the more snacking students reported they did the worse the reported sleep quality (1). They concluded that rates of perceived quality and duration of sleep remained stable over nine months (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
4(b)	**AO1(2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of each weakness (AO1) Credit **one** mark for justification/exemplification of each weakness (AO3) For example: McDermott (2008). • The administration of hot sauce to an unseen opponent is not realistic of real-life aggression to a seen person (1), therefore the MAOA-L group may not be more aggressive when face to face with someone so reducing the external validity of the results (1). • Eight of the participants claimed they realised that they were not really giving the hot sauce to someone else (1) so reducing the internal validity of the study, as shown by a post experiment interview where they said they did not believe they were forcing someone else to eat the hot sauce (1). Hoefelmann et al. (2006). • The students may not have been accurate in answering the questionnaires about their life style factors as they answered them in classrooms (1), so they may have been subject to social desirability where they answered that they drank less alcohol than they do to appear better so reducing the validity of their data (1). • The study used students who were enrolled in night classes so the results about insufficient sleep duration may not be representative of other students (1), as those who enrolled in night classes may have less time to sleep due to having more work to do because of the night classes compared to youths who did not attend night classes, so reducing population validity (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Indicative content	Mark
5	**AO1 (4 marks), AO3 (4 marks)** **AO1** • CAT scans pass X-rays through the brain to get an image of the structure of the brain so it can identify if there are any tumours in areas that affect aggression. • PET scans, as used by Raine et al. (1997) produce functional images of the brains through recording the breakdown of radioactive material that has been attached to glucose. • fMRI scans use powerful electro-magnets to measure the brains activity and has been used in the study of sleep. • All the scans send the information to a computer that can then interpret it to form a three-dimensional image of the brain. **AO3** • CAT scans use radiation so may not be suitable for everyone such as pregnant women so could not be used to form an image of the brain for some people when researching aggression. • PET scans show the activity of the brain, so can be used to help people, such as putting strategies in place to help those with low activity in the amygdala which may lead to aggression. • fMRI scans may be preferred by psychologists studying the brain and sleep as they do not involve radioactivity, unlike CAT scans and PET scans. • There is still some subjectivity in what the three-dimensional images of the brain show, as psychologists have to interpret the computer image. **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 B.

Question Number	Answer	Mark
6 (a)	**AO1 (1 mark), AO2 (1 mark)** Credit **one** mark for accurate definition (AO1). Credit **one** mark for accurate description in relation to the scenario (AO2). For example: • Attention is when a behaviour is demonstrated and we take notice of/focus on/observe selected behaviour (1). Jasmine noticed her sister, who is her role model due to being the same sex as Jasmine, demonstrating cleaning shoes (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
6 (b)	**AO1 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of one weakness (AO1). Credit **one** mark for justification/exemplification of one weakness (AO3). For example: • Charlton et al. (2000) opposes the fact that we learn violent behaviour from role models on the television so the theory lacks credibility (1), as they found that the introduction of television did not increase anti-social behaviour in the majority of the participants, so other factors may affect whether a behaviour is learnt (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
7 (a)	**AO2 (4 marks)** Credit up to **four** marks for accurate description in relation to the scenario. For example: • Elijah could take a deductive approach and decide what themes about stress he will look for in the questionnaires before he reads through them (1). Elijah could read through the questionnaires about stress and decide which themes to use if he decides on an inductive approach (1). When he has the themes for stress Elijah will decide on what codes go within the themes such as 'not sleeping' may go in a behavioural theme (1). Once Elijah has decided on what themes he will use to measure stress he will calculate how often the themes occur in all the questionnaires (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
7 (b)	**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: • Elijah could ask another person to independently code the data about stress into the themes he has created (1), as the results can then be compared and if the themes on stress are similar it will show that Elijah has not been biased in his coding (1). • Elijah could ask someone to randomly number the questionnaires and note which numbers were answered by teenagers, those in their mid-twenties and mid-thirties (1), so when he is coding the data he does not know the age of the participants who answered about the stress they felt as a teenager which may reduce experimenter bias (1). **Look for other reasonable answers.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
8 (a)	**AO2 (4 marks)** Credit up to **four** marks for accurate description in relation to scenario. For example: • Free association allows unconscious thought to become conscious, such as Willow mentioning her father instead of her husband (1). The ego defence mechanisms become weaker so unconscious thoughts such as how Willow's boss reminds her of her mother can be expressed (1). Willow's psychanalyst wanted to focus on the mistakes Willow said as they felt that there was a deeper meaning behind them and they would allow Willow to gain insight into her phobia (1). Willow felt embarrassed and did not want to talk about what she had said as her conscious was trying to protect her from her unconscious emotions about her mother (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
8 (b)	**AO2 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of a strength and a weakness in relation to scenario (AO2). Credit **one** mark for justification/exemplification of the strength and the weakness (AO3). For example: Strength. • Free association allows Willow's psychoanalyst to understand what is going on in her unconscious such as how she relates her husband with her father (1), so it allows Willow to understand the root cause of her phobia of expressing her opinion unlike other therapies such as systematic desensitisation (1). Weakness. • The use of free association can take several years before Willow feels relaxed enough to say something she did not mean to, such as how her boss has the same colour hair as her mother (1), therefore as she needs to get over her phobia of expressing her opinion in three months another therapy such as systematic desensitisation may be better for her (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>9 (a)</td><td>

AO1 (4 marks)

Credit up to four marks for correct calculation.
For example:

<table>
<tr><th></th><th>Average number of hours a week males spend doing jobs around the house</th><th>$(x - \bar{x})$</th><th>$(x - \bar{x})^2$</th></tr>
<tr><td>A</td><td>4</td><td>-1.83</td><td>3.35</td></tr>
<tr><td>B</td><td>7</td><td>1.17</td><td>1.37</td></tr>
<tr><td>C</td><td>10</td><td>4.17</td><td>17.39</td></tr>
<tr><td>D</td><td>5</td><td>-0.83</td><td>0.69</td></tr>
<tr><td>E</td><td>7</td><td>1.17</td><td>1.37</td></tr>
<tr><td>F</td><td>2</td><td>-3.83</td><td>14.67</td></tr>
<tr><td colspan="2">Mean for average number of hours a week males spend doing jobs around the house = 5.83</td><td colspan="2">Sum of differences² = 38.84</td></tr>
<tr><td colspan="4">Standard deviation = 2.79</td></tr>
</table>

Credit one mark for correct completion of column $(x - x)^2$
Credit one mark for correct calculation of sum of differences² = 38.84
Credit one mark for correct calculation of dividing the sum of the differences² by (n-1) = 7.77
Credit one mark for correct answer for standard deviation = 2.79

Look for other reasonable marking points.

</td><td>(4)</td></tr>
</table>

Question Number	Answer	Mark
9 (b)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of reason in relation to the scenario. (AO1) Credit **one** mark for justification/exemplification of one reason (AO3) For example: • If Rose uses the standard deviation she will use all the six male scores for how many hours they spend doing jobs around the house per week (1), which will give her an understanding of how representative the mean for males doing jobs around the house is (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Indicative content	Mark
10	**AO1 (4 marks), AO2 (4 marks)** **AO1** • Operant conditioning is how new behaviours are learnt through associating a behaviour with a reinforcement. • Positive reinforcement is when something desirable is given after the desired behaviour is shown. • Behaviour shaping involves breaking the final behaviour into manageable steps and using reinforcement after a step has been seen. • There are a variety of schedules of reinforcement such as fixed ratio where a reinforcement is given after a set number of responses. **AO2** • The puppy could be taught to sit if it associates sitting down with the treats. • After the puppy has waited Axel should give it a positive reinforcement such as praising it. • The puppy may need to be reinforced for rolling on its back, then a three quarter roll and finally a full roll. • As Axel is worried about giving the puppy treats all the time he could give a treat after the puppy has sat on command five times. **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
11	**AO1 (6 marks), AO3 (6 marks)** **AO1** • XYY syndrome occurs in males who have an extra Y chromosome and it is thought this causes an increase in aggression. • Males with XYY are thought to lack empathy so may not understand the impact of their aggression on others. • The MAOA gene is responsible for the production of monoamine oxidase which breaks down neurotransmitters such as noradrenaline and dopamine. • If the MAOA gene is not working properly then the monoamines cannot be broken down and this can lead to aggression. • If the MAOA gene does not allow the break down of adrenaline then people can go into the flight or fight response and if they fight it leads to an increase in aggression. • A faulty MAOA gene may lead to high levels of serotonin in early life which may mean people having a higher risk of violence behaviour and becoming more aggressive as adults. **AO3** • The XYY gene may not be responsible for aggression as it has been found that the characteristics, such as behavioural issues associated with XYY lead to labelling which then leads to aggressive behaviour. • Money (1969) found that the XYY syndrome is sometimes related to law-breaking behaviour. The relationship is positive and definite, so the extra Y gene may be responsible for some anti-social behaviour. • Godar et al. (2014) bred mice to have defective MAOA genes and they found that these mice were more aggressive, showing that genes do play a role in aggression. • Genes do not cause aggression in isolation, but due to their effect on neurotransmitters so genes alone cannot explain aggression, it is a combination of the two factors. • Brunner (1993) studied 28 males from a Dutch family with a history of aggressive crimes and found that they did have low levels of the MAOA gene suggesting genes are responsible for aggression. • Caspi et al. (2002) found that it was the interaction of the MAOA gene and abusive childhoods that lead to an increase in aggression, so genes are not the only reason for aggression. **Look for other reasonable marking points.**	**(12)**

Level	Mark	Descriptor
AO1 (6 marks), AO3 (6 marks) Candidates must demonstrate an equal emphasis between knowledge and understanding vs judgement/conclusion in their answer.		
	0	No rewardable material.
Level 1	1–3 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) 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	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 judgement/decision being presented. Candidates will demonstrate a grasp of competing arguments but response may be imbalanced. (AO3)
Level 3	7–9 Marks	Demonstrates accurate knowledge and understanding. (AO1) 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	10–12 Marks	Demonstrates accurate and thorough knowledge and understanding. (AO1) 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)

Question Number	Indicative content	Mark
12	**AO1 (6 marks), AO3 (10 marks)** **AO1** • Brendgen et al. (2005) wanted to compare social aggression with physical aggression and see to what extent they were due to genes, shared or non-shared environment. • They asked teachers and peers of 6-year-old twins to rate them on aggression using questionnaires. • They found that social aggression was 60% due to non-shared environmental factors and 20% due to each of shared environmental factors and genetic factors. • Watson and Rayner (1920) aimed to see if they could condition a fear response to a white rat in a young child. • Over a period of 17 days they repeatedly paired a loud noise from a hammer hitting a metal bar with the presentation of a white rat. • Little Albert became afraid of the white rat even when the loud noise was not presented, and this generalised to other similar objects. **AO3** • The results from Brengden et al. (2005) are generalisable as they used 234 pairs of twins, so any anomalous results would not have skewed the data, therefore the results are representative of their target population. • The results may not be valid for other cultures as 84% of the twins were of European descent, so in more collectivist cultures there may be different factors that affect physical aggression rather than genes. • The teacher ratings and peer ratings showed a significant relationship for both physical and social aggression therefore the results can be deemed reliable and not due to variables such as how the twins behaved on the day of the questionnaire. • The results may not be accurate for older children, as physical aggression declines from about 6 years old, and social aggression increases until about 8 years old. • Brengden et al. (2005) can be deemed ethical as written informed consent was gained from the parents before the study started and the Institutional review board said the questions were ethical. • Watson and Rayner's (1920) study could be seen as unethical as they deliberately caused distress to Little Albert as shown by him crying when the rat moved near to him. • Watson and Rayner (1920) knew that Little Albert was not initially afraid of the white rat as they tested him at 9 months old and he showed no fear response, so the results can be said to be valid. • Watson and Rayner (1920) had to assume that Little Albert was afraid of the white rat from his behavioural responses as he was too young to talk, so the results may be subjective. • To ensure that it was not the laboratory that caused the fear response in Little Albert they moved the study to a well-lit lecture room and found Little Albert demonstrated the fear response there so increasing the credibility of the results.	**(16)**

	• Due to the unethical nature of upsetting Little Albert it can not be repeated by other researchers to see if they would find consistent results, therefore reducing the reliability of the study as the findings cannot be checked. **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 and 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)