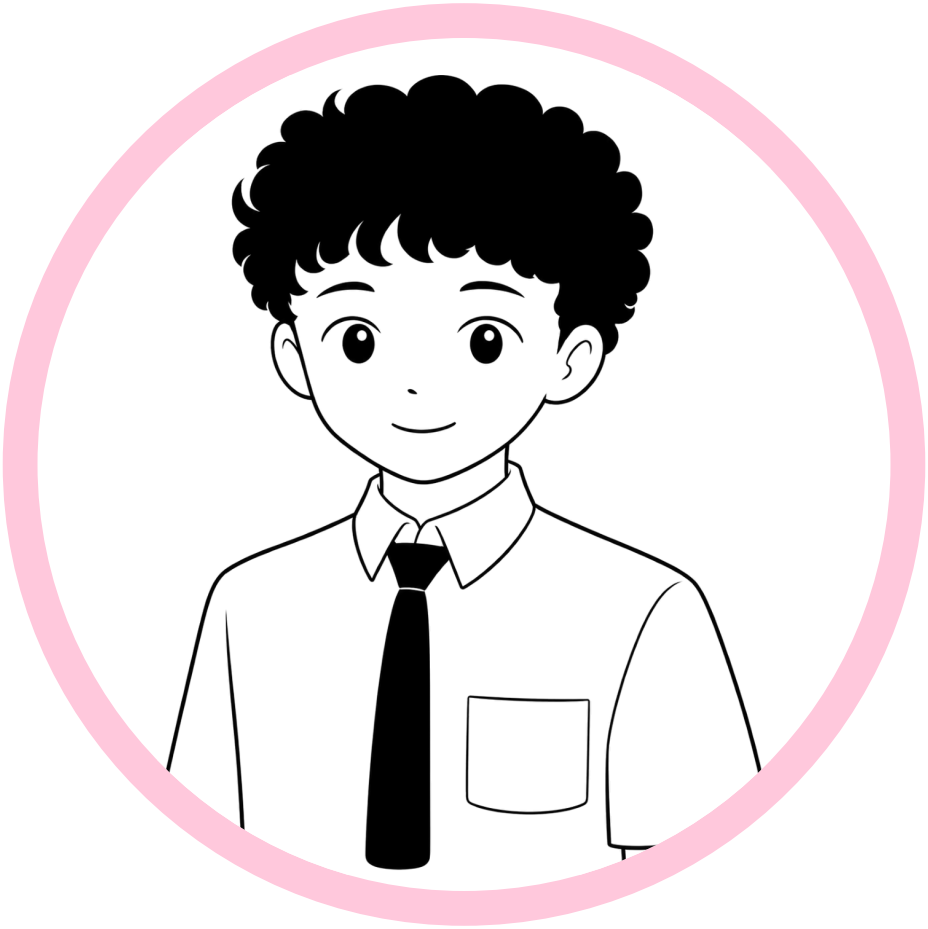
PEARSON EDEXCEL A-LEVEL PSYCHOLOGY · 9PS0

PSYCHOLOGY



MARK SCHEME

TOPIC 3: BIOLOGICAL PSYCHOLOGY

SCORE	PERCENTAGE
/112	%

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Mark Scheme

Q1.

Question Number	Answer	Mark
(a)	**AO2 (4 marks)** **One** mark for working out column **d** **One** mark for calculating column **d^2** **One** mark for substituting into equation $\mathbf{1 - \frac{6 \times 17.5}{8 \times (64-1)}}$ **One** mark for calculating Spearman's rank correlation coefficient **0.792** **Look for other reasonable marking points.**	**(4)**

Personality score	Rank 1	Attitude to recreational drug use score	Rank 2	d	d^2
2	1	3	1.5	**-0.5**	**0.25**
8	6	9	7	**-1**	**1**
5	3	6	4	**-1**	**1**
6	4.5	7	6	**-1.5**	**2.25**
9	7.5	10	8	**-0.5**	**0.25**
3	2	3	1.5	**0.5**	**0.25**
6	4.5	6	4	**0.5**	**0.25**
9	7.5	6	4	**3.5**	**12.25**
				Total:	**17.5**

Question Number	Answer	Mark
(b)	**AO2 (2 marks)** Up to two marks for determining the lowest level of significance that could be used For example: • To be significant P=0.025 is the lowest level of significance Oscar can use for a one-tailed test (where N=8) (1) as Oscar's calculated value (0.792) will still exceed the critical value (0.738) at this level (1). **Look for other reasonable marking points.**	**(2)**

Q2.

Question Number	Answer	Mark
	AO2 (2 marks) One mark for an appropriate similarity between the two explanations of aggression. One mark for an appropriate difference between the two explanations of aggression. For example: • A similarity is that they both share that there is an internal component of aggression Freud says this is an unconcious processes but biological psychology claims it is testosterone (1). However, a difference is that the biological approach to aggression is supported by objective findings whereas the psychodynamic approach is based on subjective material (1) **Look for other reasonable marking points.**	**(2)**

Q3.

Question Number	Indicative content	Marks
	AO1 (4 marks), AO3 (4 marks) **AO1** • The biological explanation sees human behaviour being primarily determined by innate factors such as our genesand hormones. • The biological explanation argues that things such as our genes, hormones, brain structure, neurochemicals (e.g. low levels of serotonin are linked to aggression) etc. influence our behaviour, e.g. aggression can be caused by an increased level of testosterone. • The biological explanation includes survival of the fittest and evolution, and aggression may have been a survival trait in humans. • The biological explanation features parts of the brain related to aggression such as pre-frontal lobes and the amygdala. • The psychodynamic explanation sees our experiences and environment as being important in determining our behaviour, such as the superego coming from our interactions with others, and catharsis being a method of releasing aggression. • The psychodynamic approach has innate features such as the focus on drives, for example aggression as being innate. The death instinct is in everyone and 'comes out' as aggression. • The psychodynamic theory considers that aggression comes from anger, which comes from frustration such as the id's desires being blocked. • Use of catharsis to explain how tension within the family, unconscious wishes and desires, can be released through aggression. **AO3** • The role of testostrone may explain why the male is most often the aggressor in the family. However, evidence suggests that testosterone does not lead to aggression (see below).	**(8)**

Question Number	Indicative content	Marks
cont.	• The psychodynamic explanation lies more clearly within the nurture side of the argument because there is such a strong emphasis on environment, such as in the development of the superego. The superego comes from others and is the conscience and ideal self, so this shows the emphasis on nurture, and the biological explanation is about nature. However, the psychodynamic explanation is about drives and the death instinct, which is nature. • The psychodynamic approach holds that the three parts of the personality: id, ego, and superego, are innate, so there is a nature side there too. • The biological approach does take into account environmental influences such as taking recreational drugs and alchohol (which can also affect serotonin levels, and low serotonin levels link with aggression), taking medication, the influence of accidents, or surgery. So even with the biological approach, it is not the case that all behaviour is determined by innate factors. • There is evidence for the biological explanation such as low levels of serotonin being indicated by low levels of metabolites, and people who engage in aggressive behaviour and have poor levels of control have been found to have low levels of metabolites. • Mann et al. (1990) found that people given a drug that lowers levels of serotonin were found to be more aggressive (measured by questionnaire). • Measuring testosterone and aggression by looking for a correlation in fact does not show a link between the two (e.g. Archer et al., 1991 and Brook et al., 2001), so this is evidence against the hormone link to aggression. • Narabyashi et al. (1972) found that 43 out of 51 patients who had had their amygdala removed showed reduced aggression, which is evidence that the amygdala relates to aggression. • Bushman (2002) carried out a study to see if hitting a punch bag and thinking about the person who had made someone angry in fact led to more aggression not less aggression, which suggests the catharsis idea is not true, which goes against the psychodynamic explanation. **Look for other reasonable marking points.**	

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.**		
Level 0	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)

Q4.

Question Number	Answer	Mark
	AO1 (2 marks), AO3 (2 marks) One mark for identification of a strength and a weakness (AO1) One mark for justification of each strength and weakness (AO3) **e.g. Heston (1966)** For example: Strength • The 47 participants born to schizophrenic mothers were carefully matched with a control group on sex, type of eventual placement, and length of time in child care (1) which meant that Heston (1966) could be more confident that having a schizophrenic mother was the only difference affecting the participants and controls (1). Weakness • Heston (1966) only found a 10.6% concordance rate which does not provide cause and effect conclusions for genetic predisposition and schizophrenia rates for adopted children (1) as there are other variables, such as drug use, that could have influenced the mental health of the children who were adopted away from their birth family (1). **Look for other reasonable marking points.**	**(4)**

Q5.

Question Number	Indicative content	Marks
	AO1 (4 marks) AO3 (4 marks) **AO1** • Raine et al. (1997) examined the brains of 41 people who pleaded Not Guilty by Reason of Insanity (NGRI) and compared these to 41 controls. • The participants were matched for sex, had a similar age (31.7 years), and did not take medication for a period before the study. • A PET scan was used to measure the brain activity of the participants. • They found that NGRIs had less activity in their prefrontal and parietal brain regions compared to controls. **AO3** • The sample of participants charged with murder was unique and a large amount of this select population was used, which increases generalisability. • The controls used in terms of sex, age, medication mean that the study was able to compare the groups reliably with few extraneous variables. • The PET scans of murderers took place in an artificial setting so the participants may have acted differently when commiting their crime in real life so the study lacks ecological validity. • The findings could be used to screen the population and identify individuals who match the NGRI brain activity which is a socially sensitive issue. **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)

Q6.

Question Number	Answer	Mark
	AO2 (4 marks) Up to **four** marks for a description of a correlational research method in relation to the scenario. For example: • Lauren could advertise for students on campus to take part in her study on aggression and select a sample from any students and staff who volunteer (1). She could ask her participants to give a self-reported aggression score on a scale from 0 (not aggressive) to 10 (very aggressive) (1). Lauren would also ask the participants to rate their level of hunger at the time they complete their aggression score (1). Lauren would compare the aggression scores with hunger levels for each participant to see if there is a relationship between hunger and aggression (1). **Look for other reasonable marking points.** **Answers must relate to the scenario.** **Generic answers score 0 marks.**	**(4)**

Q7.

Question Number	Answer	Mark
(a)	**AO2 (4 marks)** **One** mark for calculating column d **One** mark for calculating column d^2 **One** mark for substituting into equation $1-\frac{6\times91}{7\times(49-1)}$ **One** mark for calculating Spearman's rank correlation coefficient **-0.625**	**(4)**

Age	Rank 1	Number of hours sleep	Rank 2	d	d^2
17	2.5	10	6	**-3.5**	**12.25**
17	2.5	11	7	**-4.5**	**20.25**
20	4	6	2.5	**1.5**	**2.25**
24	6	7	4	**2**	**4**
21	5	4	1	**4**	**16**
16	1	9	5	**-4**	**16**
40	7	6	2.5	**4.5**	**20.25**
				Total:	**91**

Question Number	Answer	Mark
(b)	**AO2 (1 mark), AO3 (1 mark)** **One** mark for identifying the correct critical value (AO2) **One** mark for accurate judgement of relationship (AO3) For example: • The critical value is (0.786) at 0.05 for a two-tailed test when n=7 which more than the calculated value (of 0.625) (1) so there is no significant relationship between age and number of hours of sleep and the null hypothesis should be accepted (1). **Look for other reasonable marking points.** **Answers must relate to the scenario.**	**(2)**

Q8.

Question Number	Answer	Mark
(a)	**AO2 (2 marks)** Up to two marks for describing how Tabitha could use a volunteer sampling technique. For example: • Tabitha could post a notice on social media advertising for female participants aged between 20 years old and 30 years old (1) and provide her contact details for them to respond and offer to take part in her research about brain activity and aggression (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Answers must relate to the scenario.**	**(2)**

Question Number	Answer	Mark
(b)	**AO2 (3 marks)** Up to three marks for describing the use of a PET brain-scanning technique in the investigation. For example: • Tabitha would give the female participants a radioactive tracer before they took part so the PET scan can measure their brain activity in response to the stimuli (1). Tabitha would need to take a measure of the resting brain activity prior to any aggressive or non-aggressive stimuli being presented to the participants (1). She would then show each participant the film scenes, such as an aggressive car chase or calm walk in a park to measure the brain activity in response to each scene (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Answers must relate to the scenario.**	**(3)**

Question Number	Answer	Mark
(c)	**AO2 (1 mark), AO3 (1 mark)** One mark for identification of a strength in relation to the scenario (AO2) One mark for justification of the strength (AO3) For example: • A PET scan will give Tabitha an image of the participant's brain activity when they are watching the scenes from the films that can be checked by other researchers (1) which increases the reliability of her findings about aggression as multiple researchers can interpret the scan to achieve consistency (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.** **Answers must relate to the scenario.**	**(2)**

Question Number	Answer	Mark
(d)	**AO2 (1 mark), AO3 (1 mark)** One mark for identification of an improvement in relation to scenario (AO2) One mark for justification of the improvement (AO3) For example: • Tabitha could use a more representative sample of participants by including different ages from 18 years old to 75 years old (1), which would improve the generalisability of her findings about brain activity and aggression to a wider target population of different generations of people (1). **Look for other reasonable marking points.** **Answers must relate to the scenario.** **Generic answers score 0 marks.**	**(2)**

Q9.

Question Number	Indicative content	Mark
	AO1 (4 marks) AO3 (4 marks) **For example: Gottesman and Shields (1966)** **AO1** • Twins were assessed for their zygosity (e.g. blood grouping). • There was a higher concordance rate for MZ twins for schizophrenia compared to DZ twins. • To determine the presense of a mental disorder qualitative and quantitative methods were used (e.g. case histories) • Twins were sampled using opportunity sampling from twins seen by the Maudsley and Bethlem Royal Joint hospital. **AO3** • While twins share genetic information it is difficult to separate environmental factors so studies cannot establish genetics as a causal factor for behaviour. • The predisposition of schizophrenia was not 100% twin studies are not able provide conclusive evidence of genetic influences on human behaviour. • If the same measures of schizophrenia (e.g. MMPI) are used then a twin study could be easily replicated. • Twin studies have small sample sizes as twins are not common, so findings may not be representative of a wider population. **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)

Q10.

Question Number	Indicative Content	Mark
	AO1 (4 marks), AO3 (4 marks) **AO1** • Freud stated that the ego employs a range of defence mechanisms to deal with conflict and problems in life. • In Freud's view aggression originates from the redirection of self-destructive death instincts away from the self towards others. • Catharsis is a way of venting aggression, it involves releasing internal emotions such as anger or frustration. • Displacement is when a person uses an alternative object to satisfy an impulse, such as a punch bag to displace aggression. **AO3** • Components of personality such as the ego are difficult to measure as they do not exist as a specific region of the brain so Freud's ideas lack scientific credibility. • Biological psychology provides evidence that aggression is not a death instinct but has biological roots, for example Dabbs et al. (1995) found high levels of testosterone in 692 male prisoners. • Verona and Sullivan (2008) found that people reacting with aggression when frustrated had a reduced heart rate compared to those not reacting aggressively, providing partial support for catharsis theory. • Bresin et al. (2013) found that adaptive forms of aggression could create a calming effect and empower participants with the skills to regulate anger in the future, so psychodynamic explanations have practical application. **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)

Q11.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO2 (4 marks), AO3 (4 marks) **AO1** • Obedience is the process of following a direct order from an authority figure. • Social impact theory assumes multiplicative factor of strength, immediacy and number influence social behaviour. • Biological psychology includes the evolutionary element of human behaviour. • Hormones such as testosterone may lead to aggression. **AO2** • Matt may have been told by a gang leader to hit another person. • Matt may be influenced by a high-status friend to be aggressive. • He may be fighting to show that he is stronger than other males around him. • As Matt is 16 years old, he has increased levels of testosterone. **AO3** • Blass (2012) suggests that obedient behaviour is similar cross-culturally and therefore is a plausible explanation of Matt's behaviour. • Social impact theory does not consider individual differences like personality and sees humans as passive so may not fully explain behaviour. • Raine (1997) suggests that brain activity is different in convicted murderers so biological explanations that focus on the brain rather than evolution may be a better explanation. • Freud suggests that unconscious processes play a significant role in aggression not hormonal imbalances, therefore it may be that neither social or biological explanations can explain Matt's aggression. **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.		
Level 1	0	No rewardable material.
Level 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)

Q12.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO2 (4 marks) For example: Key question: How effective is drug therapy for treating addiction? **AO1** • Addiction to drugs costs society in terms of crime and NHS costs so needs to be treated. • Methadone is a replacement drug that reduces cravings for heroin so could stop addicts offending for access to heroin. • Methadone reduction programmes can discourage abstinence from the heroin so cost society more in economic and social costs. • Heroin changes the brain and body so any treatment needs to also have a biological basis. **AO2** • Repeated exposure to recreational drugs can lead to tolerance and withdrawal symptoms which continues drug use and can lead to social and economic costs so needs to be treated. • Methadone mimics the action of heroin at the synaptic level through dopamine and endorphins. • Reduction of the methadone doses means the user will experience withdrawal symptoms such as cramps and vomiting so can lead to relapse. • Brain scanning methods such as PET could investigate the activity of methadone treatment on the brain to show if it is effective. **Look for other reasonable marking points.**	**(8)**

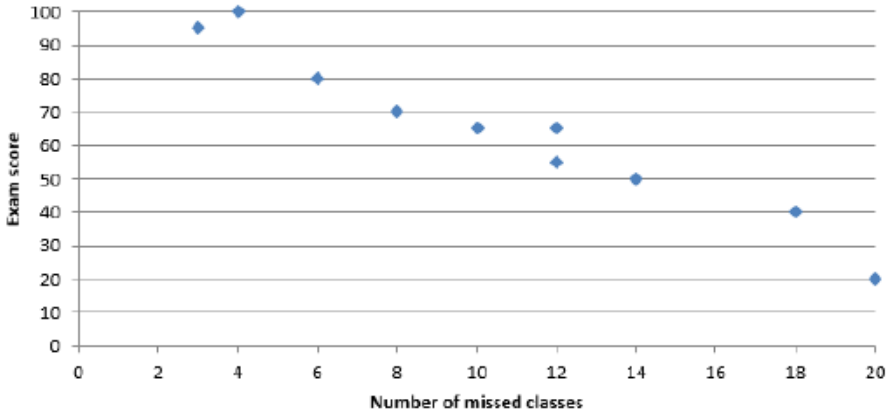
Level	Mark	Descriptor
AO1 (4 marks), AO2 (4 marks) **Candidates must demonstrate an equal emphasis between knowledge and understanding vs application in their answer.**		
	0	No rewardable material
Level 1	1–2 Marks	Demonstrates isolated elements of knowledge and understanding. (AO1) Provides little or 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)

Q13.

Question Number	Indicative Content	Mark
	AO1 (4 marks), AO2 (4 marks) **AO1** • Correlational research measures two variables to see if there is a relationship between them. • Correlations can use the same individual participants where each participant will be measured on both co-variables. • The results of correlation research can be plotted on a scatter diagram to show a direction, such as positive correlation, which is when one variable increases the other variable increases. • A correlation can be considered strong or weak, which shows the strength of the relationship between the covariables being tested. **AO2** • Jinal could measure nicotine through cigarette use or vaping and count the number of negative life experiences in childhood to see if one increases alongside the other. • She could give a questionnaire to participants to gather data on how many cigarettes are smoked per day and measure the number of negative childhood experiences the same participants had at different ages. • Jinal may use a scatter diagram to plot her data about the volume of recreational drug use and how many negative childhood experiences they had to see if there is a positive correlation. • She could determine the strength of the relationship between nicotine and negative childhood experiences, if this is weak she could then investigate other factors involved in nicotine use. **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)

Q14.

Question Number	Answer	Mark
(a)	**AO2 (3 marks)** One mark for correct/appropriate title One mark for correct/appropriate labelling of axes One mark for correct plots of data points **A scatter diagram to show the correlation between exam score and number of missed classes**  **Look for other reasonable marking points.**	(3)

Number		
(b)	**AO2 (1 mark)** One mark for correctly identifying the correlation they have drawn For example: • Negative / Negative correlation (1) **Look for other reasonable marking points.**	(1)

Question Number	Answer	Mark
(c)	**AO2 (2 marks)** One mark for each reason stating why Spearman's rho would be an appropriate statistical test For example: • They are looking for a relationship (1). • They have ordinal data (1). **Look for other reasonable marking points.**	(2)

Q15.

Question Number	Answer	Mark
	AO2 (4 marks)	**(4)**

Self-rated aggression	Rank 1	Peer-rated aggression	Rank 2	D	d^2
2	6.5	3	6	0.5	0.25
2	6.5	6	4	2.5	6.25
4	5	2	7	-2	4
5	4	5	5	-1	1
8	3	7	3	0	0
9	1.5	8	2	-0.5	0.25
9	1.5	9	1	0.5	0.25
				Total:	12

One mark for accurate completion of column d (minus signs can be present or not for the mark).

One mark for accurate completion of d^2.

One mark for substituting into equation

$$1 - \frac{6 \times 12}{7(49-1)}$$

One mark for 0.786/0.79.

Q16.

Question Number	Answer	Mark
	AO2 (3 marks) Up to **three** marks for description of how hormones could account for Charles's behaviour. For example: • Charles may have an imbalance of testosterone to cortisol (T/CRT ratio) which could have contributed to him being aggressive when shouting insults at his peers (1). Charles may have been exposed to more testosterone in the womb and during puberty which could have lead to him becoming more aggressive in his science class (1). Letting in an important goal may cause stress but his cortisol levels may not have increased enough to inhibit his aggression and stop the fight with the captain (1). **Look for other reasonable marking points.** **Answers must relate to the scenario.** **Generic answers score 0 marks.**	**(3)**

Q17.

Question Number	Indicative Content	Mark
	AO1 (4 marks), AO2 (4 marks) **AO1** • Hormones are produced by the endocrine system in glands across the body to transmit information that results in behaviours. • Testosterone is a hormone produced in the adrenal gland in females and high levels have been associated with aggression. • Cortisol is produced when faced with stressors and low levels of cortisol have been associated with aggression. • Adrenaline is a hormone linked to a 'flight or fight' reaction to a stimuli that triggers a need to be physically fast or strong. **AO2** • There may be an imbalance in the hormones, such as adrenaline or testosterone, produced by Rachael resulting in her history of aggressive tendencies and abusive behaviours. • Rachael would not be able to control excessive testosterone in her body, which would explain why she feels unable to manage her levels of aggression. • She may not be producing sufficient cortisol to combat her feelings of stress explaining why she continues to feel angry at people around her. • An increase in adrenaline may have triggered Rachael's 'fight' response where she pushed the other prisoner over rather than reasoning with that person. **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)