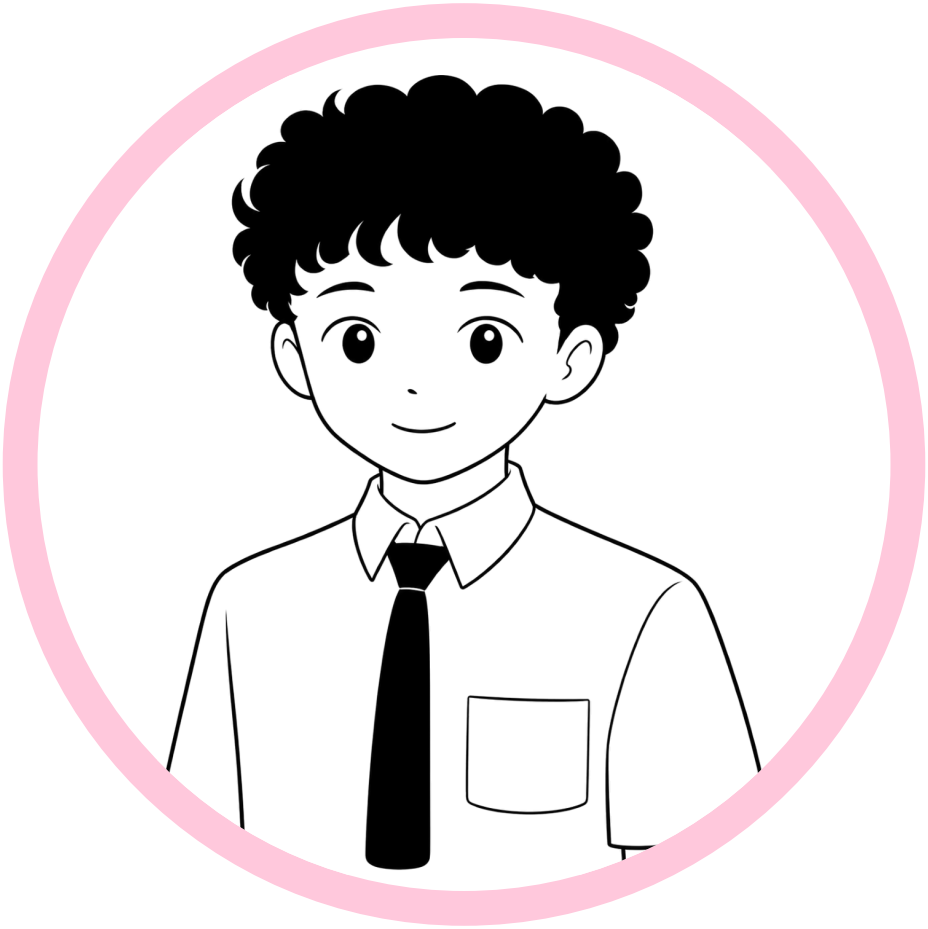
PEARSON EDEXCEL IAL PSYCHOLOGY · YPS01

PSYCHOLOGY



MARK SCHEME

BIOLOGICAL PSYCHOLOGY

SCORE	PERCENTAGE
/334	%

STEMUP

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Mark Scheme

Q1.

Question Number	Answer	Mark
(a)	**AO2 (2 marks)** Credit **one** mark for a partially operationalised null hypothesis. Credit **two** marks for a fully operationalised null hypothesis. For example: • There will be no difference in the mood score for the participants who have the anti-depressants and the participants who do not have the anti-depressants (1). • There will be no difference in the mood score from 1 (happy mood) to 7 (low mood) between the participants who received the anti-depressants for a month and those who had no anti-depressants, and any difference will be due to chance (2). **Look for other reasonable marking points.** **Answer must relate to the scenario.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(b)	**AO2 (1 mark)** Credit **one** mark for accurate mean. • 4.33 **Reject all other answers.**	**(1)**

Question Number	Answer	Mark
(c)	**AO2 (1 mark)** Credit **one** mark for accurate median. • 2 **Reject all other answers.**	**(1)**

Question Number	Answer	Mark
(d)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for the accurate identification of what the two standard deviations show (AO2) Credit **one** mark for justification/exemplification of what the two standard deviations show (AO3) For example: • Those who had the anti-depressants had a standard deviation of 1.03 which is only 0.18 lower than the standard deviation for those who did not receive anti-depressants (1) therefore, the two standard deviations show there is not much difference in the spread of the scores for mood between those who had anti-depressants for their seasonal affective disorder and those who did not (1). **Look for other reasonable marking points.** **Answer must relate to the scenario.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(e)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for the accurate identification of a weakness in relation to the scenario (AO2) Credit **one** mark for justification/exemplification the weakness (AO3) For example: • Harrison asked the participants to score their own mood out of seven, so those on anti-depressants may have shown demand characteristics (1), as they may have guessed the aim was to see if anti-depressants helped their mood so they may have said they were happier than they were so affecting the validity of the experiment (1). **Look for other reasonable marking points.** **Answer must relate to the scenario.** **Generic answers score 0 marks.**	**(2)**

Q2.

Question Number	Answer	Mark
(a)	**AO2 (2 marks)** Credit **one** mark for an accurate identification of the independent variable. Credit **one** mark for an accurate identification of the dependent variable. For example: Independent variable • Whether the participants spent no more than 1 hour a day playing online games, or spent up to 7 hours a day playing online games (1). Dependent variable • The number of aggressive thoughts recorded over each of the two weeks (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(b)	**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: • Harold used the Wilcoxon Signed Ranks test as his experimental design was repeated measures (1), as the same participants stated the number of aggressive thoughts, they had in the first and second week (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(c)	**AO2 (4 marks)** Credit **one** mark for correct completion of **difference** Credit **one** mark for correct completion of **ranked difference** Credit **one** mark for a correct calculation of **sum of both ranks (8 and 7** Credit **one** mark for a correct answer for **T= 7** For example:	**(4)**

Participant	Number of aggressive thoughts in week 1	Number of aggressive thoughts in week 2	Difference	Ranked Difference
A	2	0	**2**	**3**
B	7	8	**-1**	**1.5**
C	5	9	**-4**	**4**
D	1	1	**0**	
E	12	7	**5**	**5**
F	3	3	**0**	
G	2	3	**-1**	**1.5**

Look for other reasonable marking points.

Question Number	Answer	Mark
(d)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of an improvement in relation to the scenario (AO2). Credit **one** mark for justification/exemplification of the improvement (AO3). For example: • Harold could have only used aggressive online games in his investigation to improve the validity of his investigation (1) as this would ensure that all the participants played the same sort of games and he could determine if aggressive games caused more aggressive thoughts (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Q3.

Question Number	Answer	Mark
a	**AO1 (1 mark)** Credit **one** mark for accurate statement. For example: • Pre-frontal cortex (1). **Look for other reasonable marking points.**	**(1)**

Question Number	Answer	Mark
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: • It ignores other factors that may cause aggression, such as social learning theory so it can be considered reductionist (1), which states that aggression is learnt through observing then imitating role models rather than the functioning of the brain (1). • A lot of the research is carried out on animals so it may not be true for humans as we rarely show predator aggression unlike animals (1) so humans may not be aggressive in the same situations as animals such as cats so the results from animal studies may not be generalisable (1) . **Look for other reasonable marking points.**	**(4)**

Q4.

Question Number	Answer	Mark
(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
(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)**

Q5.

Question Number	Answer	Mark
a	**AO1 (1 mark)** Credit **one** mark for accurate definition. For example: • An external zeitgeber is an environmental cue that helps regulate biological rhythms (1). **Look for other reasonable marking points.**	**(1)**

Question Number	Answer	Mark
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: • Siffre (1975) had no external cues when he was in a cave for 6 months and his biological rhythm extended to 25 hours (1), showing that external zeitgebers, such as daylight, play a role in regulating our 24-hour sleep wake cycle giving the explanation credibility (1). • Skene and Arendt (2007) found that most blind people who have some light perception have normal circadian rhythms unlike those without any light perception (1), showing how external zietgebers regulate our circadian rhythms which includes the sleep wake cycle suggesting it is a plausible explanation (1). **Look for other reasonable marking points.**	**(4)**

Q6.

Question Number	Answer	Mark
(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
(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
(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)**

Q7.

Question Number	Answer	Mark
(a)	**AO1 (3 marks)** Credit up to **three** marks for accurate description For example: • Raine et al. (1997) found that the 41 NGRIs had lower glucose metabolism in the prefrontal cortex compared to the control group (1). The murderers had lower activity in the left angular gyrus and in the parietal area of the brain (1). There was no significant difference in the metabolism of glucose in the lateral temporal lobe between the murderers and the control group (1). **Look for other reasonable marking points.**	**(3)**

Question Number	Answer	Mark
(b)	**AO1 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of each strength/weakness (AO1) Credit **one** mark for justification/exemplification of the strength/weakness (AO3) For example: Strength • Raine et al. (1997) matched the NGRIs with the control group for age, sex and factors such as whether they have schizophrenia (1) which increases the validity of the results as they can be sure the results were not due to other factors which may affect brain activity, such as mental illness (1). Weakness • Raine et al. (1997) only used murderers who pleaded guilty by reasons on insanity as his experimental group (1), this limits the generalisability of the results as there may not be the same brain activity in criminals who committed murder but did not plead insanity (1). **Look for other reasonable marking points.**	**(4)**

Q8.

Question Number	Answer	Mark
(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
(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
(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)**

Q9.

Question Number	Answer	Mark
(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
(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)**

Q10.

Question Number	Answer	Mark
(a)	**AO1 (2 marks)** Credit up to **two** marks for accurate description. For example: • Exposure to testosterone whilst in the womb can affect the development of the brain which can lead to an increase in aggression (1). Exposure to too much testosterone after birth stimulates cell growth in the hypothalamus and amygdala so may increase aggression (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
(b)	**AO1 (2 marks), AO3 (2 marks)** Credit **one** mark for accurate identification of each strength/weakness (AO1) Credit **one** mark for justification/exemplification of the strength/weakness (AO3) For example: Strength • Dabbs (1987) found that male prisoners with higher levels of testosterone in their saliva had often been convicted of more violent crimes giving the theory credibility (1), especially as 10 out 11 prisoners with the highest levels of testosterone had committed violent crimes, showing testosterone can affect aggression (1). Weakness • Bird et al. (2016) found that testosterone did not lead to an increase in aggression so the theory is not a complete explanation of aggression (1), as they found that scoring highly in narcissism affected males' aggression towards a same sex rival (1). **Look for other reasonable marking points.**	**(4)**

Q11.

Question Number	Answer	Mark
(a)	**AO2 (2 marks)** Credit **two** marks for an accurate description in relation to the scenario. For example: • Estelle could have put a poster up in the local health care centre asking for participants for her investigation on aggression in males and females (1). On her poster she would have stated when and where the participants should attend for her investigation on aggression in males and females (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(b)	**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: • As the sample is volunteer only those males and females who think they are not very aggressive may agree to take part in the study (1), which means the results will be biased and not be true of all males and females as the very aggressive people will not have taken part (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(c)	**AO2 (1 mark)** Credit **one** mark for the correct answer. For example: • 4.5 (1). **Reject all other answers.**	**(1)**

Question Number	Answer	Mark
(d)	**AO2 (4 marks)** For example: **Number of aggressive acts in a day** / $(x - \bar{x})$ / $(x - \bar{x})^2$ G: 3 / -0.33 / **0.11** H: 5 / 1.67 / **2.79** I: 2 / -1.33 / **1.77** J: 4 / 0.67 / **0.45** K: 1 / -2.33 / **5.43** L: 5 / 1.67 / **2.79** Mean = 3.33 Sum of differences² = **13.34** Standard deviation = **1.63**	

	Credit **one** mark for correct completion of **column** $(x - \bar{x})^2$ Credit **one** mark for correct calculation of **sum of differences²** = **13.34** Credit **one** mark for correct calculation of **dividing the sum of the differences² by (n-1)** = **2.67** Credit **one** mark for correct answer for **standard deviation** = **1.63** **Look for other reasonable marking points.**	**(4)**

Q12.

Question Number	Indicative content	Mark
	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)

Q13.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO3 (4 marks) **AO1** • Exposure to excess testosterone whilst in the womb can affect the developing brain which may lead to an increase in aggression. • After birth testosterone sensitises some neural circuits, stimulating cell growth, including in the amygdala which can lead to aggression. • Low levels of cortisol can lead to an under aroused autonomic nervous system so people may be aggressive to increase arousal. • Adrenaline when released activates the flight or fight response, if the person chooses to fight this will lead to aggression. **AO3** • Chang et al. (2012) found that pre-experience levels of testosterone and cortisol positively correlated with displays to a mirror image, suggesting aggressive behaviours, therefore hormones can explain aggression in animals. • A lot of studies on the effect of hormones on aggression are done on animals, so they may not be a good explanation of aggression in humans as animals such as fish do not have the same social behaviour as humans. • The study of hormones and aggression is more scientific than other theories such as Freud's as it is more empirical, as levels of hormones and aggressive acts can be directly observed, making it a more credible explanation of aggression. • Dabbs and Morris (1990) found that socio-economic status was also a factor in aggression, with testosterone having less of an effect on aggression in those from higher social classes, so hormones are not a complete explanation of aggression. **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)

Q14.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO3 (4 marks) **AO1** • Infradian rhythms last more than 24 hours and affect the menstrual cycle and seasonal affective disorder. • The menstrual cycle last about 28 days and starts with menstruation when progesterone is low and can affect female behaviour. • Seasonal affective disorder is a twelve-month cycle with people becoming depressed during the winter months when there is less light. • The lack of daylight causes more melatonin to be produced which makes the person feel more tired throughout the winter months. **AO3** • Law (1983) found that significantly more females menstruated around the new moon compared to other phases of the moon suggesting human behaviour and infradian rhythms are affected be external factors so infradian rhythms on their own are not a valid explanation of all human behaviour. • Guéguen (2012) found that women walk slower and more sexily in front of men when they were near ovulation showing that infradian rhythms do affect human behaviour giving the explanation credibility. • Yang et al. (2020) found that vegetarianism and higher alcohol consumption were associated with seasonal affective disorder so it may not just be due to biological rhythms but to being vegetarian and having higher alcohol uptake, therefore they do not explain all human behaviour. • Eastwood et al. (1985) found that people with affective disorders had a greater amplitude of periodicities in their infradian rhythms compared to a control groups, showing infradian rhythms do affect our mood and is a valid 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)

Q15.

Question Number	Answer	Mark
(a)	**AO1 (4 marks)** Credit up to **four** marks for an accurate description. For example: • Twin studies use monozygotic (MZ) and dizygotic (DZ) twins to help determine if aggression is due to nature or nurture (1). Psychologists would record the aggression of both pairs of twins in their study, for example through observations (1). The concordance rates for aggression between monozygotic (MZ) twins and dizygotic (DZ) twins is compared (1). If the concordance rate is higher for monozygotic (MZ) twins, then aggression is at least partly genetic (1). **Look for other reasonable marking points.**	**(4)**

Question Number	Answer	Mark
(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. • Confounding variables are more controlled, as the twins share the same environment before they are born and very similar environments after they are born (1), therefore it is a valid way to determine whether aggression is due to nature or nurture as it has higher internal validity than some other research methods (1). Weakness. • Twin studies often base the identification of a pair of twins as monozygotic (MZ) or dizygotic (DZ) on similarities in appearance rather than DNA, which can affect the results on aggression (1), so may influence the validity of any findings on aggression as some twins may have been incorrectly labelled as monozygotic (MZ) or dizygotic (DZ) (1). **Look for other reasonable marking points.**	**(4)**

Q16.

Question Number	Answer	Mark
(a)	**AO2 (4 marks)** Credit up to **four** marks for accurate description in relation to the scenario. For example: • Nancy should make sure her bedroom is dark at night time as this stimulates the production of melatonin which will help her sleep (1). When Nancy feels tired in the middle of the day, she could go out for a walk to expose herself to sunshine so the light would stimulate her suprachiasmatic nucleus (1). If Nancy is feeling tired whilst she is at work, she should make sure there is plenty of bright light in the office so the SCN realises it is daytime and resets the 24-hour body clock, including the sleep wake cycle (1). Nancy should regulate her eating so that she has a big meal in the evening as this will help reset her 24-hour clock so that she can sleep in the evening (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
(b)	**AO2(1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of a strength in relation to the scenario (AO2) Credit **one** mark for justification/exemplification of the strength (AO3) For example: • Research such as Skene and Arendt (2007) show that the light is an important factor in helping Nancy regulate her sleep wake cycle following her return from abroad (1), as they found that blind people who have some perception of light had normal circadian rhythms so giving the explanation credibility (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Q17.

Question Number	Answer	Mark
(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
(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)**

Q18.

Question Number	Answer	Mark
(a)	**AO1 (2 marks)** Credit up to **two** marks for an accurate description of research into the sleep-wake cycle For example: • Research into circadian rhythms can use case studies where the participant(s) are isolated without any natural daylight to see the effect this has on the sleep-wake cycle (1). Siffre (1972) found that his circadian rhythm went into a 48-hour cycle two times during the six months he was in a cave (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
(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 • Some studies into the circadian sleep-wake cycle use animals, as areas of the brain such as the SCN can be lesioned (1), which allows us to gain more knowledge of which areas of the brain affect the circadian sleep-wake cycle as we would not ethically be able to do this on humans (1). Weakness • The results from studies that only use one person, such as Siffre (1972), are not representative of the general population (1), as their circadian sleep-wake cycle may not change to a longer cycle or the same length of time so the results may not be generalisable to others (1). **Look for other reasonable marking points.**	**(4)**

Q19.

Question Number	Answer	Mark
(a)	**AO2 (4 marks)** Credit up to **four** marks for accurate description in relation to the scenario. For example: • Meryl could use volunteer sampling where she advertises for people interested in a study on hormones and aggression to take part in a study naming the time and place (1). Meryl could take saliva swabs of her participants to measure the amount of cortisol each participant has in their saliva (1). The participants could be asked to say how many times they were physically and/or verbally aggressive during the past week (1). Meryl would have to ensure that none of the participants had any life events during the past few weeks that may make them more aggressive than normal (1). **Look for other reasonable marking points.** **Answer must relate to the scenario.** **Generic answers score 0 marks.**	**(4)**

Question Number	Answer	Mark
(b)	**AO2(1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of the significance (AO2) Credit **one** mark for justification/exemplification of the significance (AO3) For example: • Meryl did find a significant correlation between hormones and aggression (1) as the calculated value of 0.569 exceeds the critical value of 0.560 for a two tailed test at $p \leq 0.05$ (1). **Look for other reasonable marking points.** **Answer must relate to the scenario.** **Generic answers score 0 marks.**	**(2)**

Q20.

Question Number	Answer	Mark
(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
(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)**

Q21.

Question Number	Answer	Mark
	AO2 (4 marks) Credit up to **four** marks for an accurate description in relation to the scenario. For example: • An infradian rhythm is a biological rhythm that lasts for more than a day, Kaiko's menstrual cycle lasts for 29 days (1). Women prefer masculine faces during their fertile period which is why Kaiko finds different types of men attractive at different times in her menstrual cycle (1). After the egg has been released progesterone and oestrogen increase and thicken the lining of the womb ready for fertilisation which may be why Kaiko is angrier a week before menstruation (1). If the egg is not fertilised the levels of oestrogen and progesterone drop and menstruation occurs, which can explain why Kaiko becomes calmer during menstruation (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(4)**

Q22.

Question Number	Answer	Mark
(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
(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)**

Q23.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO2 (4 marks) **AO1** • Informed consent is given when the participants agree to be part of the study knowing exactly what will be done during the study and how their results will be used. • Participants should not be harmed in any way this includes physical harm and emotional harm. • A study is reliable if it can be conducted again and similar results are found. • To be reliable extraneous variables should be controlled as much as possible so the study can be replicated. **AO2** • For our practical we told our participants that we were looking for a correlation between the number of hours slept and the number of hours spent on social media. • Our participants were not caused any emotional or physical ham as they were answering questions about their sleep and social media use, we were not manipulating them in any way. • Several different groups in our class conducted the same investigation on different participants and we all found there was a negative correlation between the number of hours slept and time spent on social media. • Some extraneous variables were not controlled, as some participants answered the questionnaire on sleep and social media use on their own, and some answered it whilst they were with their friends. **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)

Q24.

Question Number	Indicative content	Mark
	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)

Q25.

Question Number	Indicative content	Mark
	AO1 (4 marks), AO2 (4 marks) **AO1** • If the amygdala misinterprets a situation as threatening it can lead to an increase in aggression. • When the amygdala is activated it can bypass the rational part of the brain so we are less likely to think about the consequences of our aggression. • The hypothalamus keeps testosterone in homeostasis, if it is damaged there may be too much testosterone released which can increase aggression. • The pre-frontal cortex helps control our impulses, if it is damaged, we are less able to control our impulses and so may be more aggressive. **AO2** • Sylvester may have processed the customer as a threat to himself which is why he kicked them after he had thrown them out of the shop. • If Sylvester's amygdala reduced his ability to think rationally, he did not think about the fact he would lose his job if he was aggressive to any more customers. • If Sylvester's hypothalamus cannot regulate his testosterone effectively, he could have excess testosterone which caused him to shout at his partner. • Sylvester may have been unable to control his impulse to fight supporters of an opposing football team due to damage to his prefrontal cortex so he got involved in the fight. **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)

Q26.

Question Number	Indicative content	Mark
	AO1 (6 marks), AO3 (6 marks) **AO1** • CBT works by challenging a client's negative thoughts about winter and what they are able to do during the winter. • The client will have a number of weekly or bi-weekly sessions with a trained therapist which could be in a group with other people who have seasonal affective disorder. • The first session will establish what the client hopes to achieve through CBT, such as being able to socialise with friends during the winter months. • The therapist will help the client change their negative thought patterns about winter into more positive thought patterns and ask the clients to practice the new thought patterns at home. • The client may be asked to provide evidence to support their negative thought patterns about winter, or to engage in activities that would disprove the negative thoughts. • The behavioural aspect of the therapy includes getting clients to actively engage in activities that will help reduce anxiety about the winter months.	

	AO3 • Rohan et al. (2015) found that combining light therapy with CBT was more effective in treating seasonal affective disorder two winters after treatment compared to those who only had light treatment. • If the client is not motivated to engage with the therapist due to the depression caused by seasonal affective disorder, then CBT will not be effective as it requires the client to talk about their thought patterns. • CBT does not have possible side effects unlike antidepressants so may be better for clients who are worried about the effects of taking antidepressants. • CBT focuses on the current problem of seasonal affective disorder; it does not address past issues which may have caused the onset of seasonal affective disorder so may not be fully effective. • The skills gained in CBT can be used in future winters so the clients do not need to have treatment for seasonal affective disorder every winter, unlike the use of light therapy. • Meyerhoff et al. (2018) found that light therapy led to the remission of early insomnia, psychic anxiety, hypersomnia, and social withdrawal in less time than CBT. **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 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)

Q27.

Question Number	Indicative content	Mark
	AO1 (6 marks), AO3 (10 marks) **AO1** • Brendgen et al. (2005) used a sample of 234 6-year-old twin pairs from Montreal, of which 94 pairs were monozygotic twins. • The teachers were asked to rate each twin on social and physical aggression using items based on a Preschool Social behaviour Scale • It was found that 60% of the variance in social aggression was due to unique environmental factors, and 20% was due to shared environmental factors. • Skinner used 8 pigeons that were at 75% of their normal weight. • A food hopper was swung into the experimental cage for five seconds each time. • The pigeons repeated behaviour, such as turning counter clockwise between the reinforcement of the food hopper.	**(16)**
	AO3 • Brendgen et al. (2005) gained active written consent from the parents of the six-year-old twins before gathering the data so it is ethical as informed consent was gained. • The children could have been distressed if they found out that other children had said they told mean secrets about another child. • The results may not be the same when the children are older as social aggression does not fully develop until around 8 years old, therefore the results may not be reliable if the study was repeated on the twins again. • The children's answers may have been influenced by who their friends were on the day they had to do the peer ratings, so if the study was repeated on a different day, they may not circle the same twins. • The data are objective data as Brendgen et al. (2005) totalled the number of times each twin was circled for each statement, therefore increasing the reliability of the results as the researchers did not need to interpret the data. • The pigeons were starved to 75% of their weight which could be deemed unethical as they were deliberately kept hungry. • Skinner only used 8 pigeons which is a small number of animals to try and ensure the experiment was as ethical as possible. • Skinner used pigeons which are protected animal as they are a living vertebrate, his study would have been more ethical if he had not used a protected animal, such as an insect. • Skinner controlled the experiment, for example the food hopper was swung for 5 seconds at a time, so extraneous variables may not have affected his results. • In six out of eight cases two observers had perfect agreement when counting the number and types of behaviour demonstrated by the pigeons showing inter-rater reliability. **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)

Q28.

Question Number	Indicative content	Mark
	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)

Q29.

Question Number	Indicative content	Mark
	AO1 (6 marks), AO2 (4 marks), AO3 (6 marks) **AO1** • Males with XYY syndrome are thought to have behavioural issues such as being more impulsive than XY males and may engage in more anti-social behaviour such as aggression. • A dysfunction in the MAOA gene means that monoamine oxidase cannot be broken down which affects the levels of neurotransmitters such as serotonin and noradrenaline. • Those with a dysfunction of the MAOA gene may more readily go into the flight or fight response because of the neurotransmitters, so leading to an increase in aggression. • Social learning theory states that we observe our role models' behaviour and then imitate it, which can include aggressive behaviour. • Role models are people that we look up to because they are similar to us, or have some sort of power, which may be due to their aggressive behaviour. • If a role model is reinforced for their aggressive behaviour, then that behaviour is more likely to be imitated in the hope that the imitator will get the same reward. **AO2** • Fred may have XYY syndrome as he is impulsive, such as throwing a plate at Eliza when they were arguing. • As the father has been in trouble for arguing and threatening a neighbour, he may have a dysfunction of the MAOA gene which Eliza and Fred have inherited explaining why they are aggressive. • As their father is male and has power over Fred then he may see the father as a role model and so imitate his behaviour such as shouting at Eliza. • Eliza saw Fred being rewarded with sweets after he had thrown a plate at her, so she may have thrown food at the other girl in the hope that she would also be rewarded.	**(16)**
	AO3 • Theilgaard (1984) found that males with XYY syndrome provided more aggressive content and less anti-aggressive content to the stories from their Thematic Apperception Test, showing genes may explain why Fred is aggressive. • The MAOA gene may not explain all aggression as MAOA-L is very rare in women so there must be other reasons for their aggression, making it an incomplete explanation of aggression. • Eusebi et al. (2020) found that a more aggressive species of cattle had a lower number of repetitions of nucleotide 'C' in the MAOA gene so this could explain the aggression of the two children. • Charlton et al. (2000) found that the introduction of television to a remote island did not significantly increase aggressive behaviour, so Fred and Eliza may not have learnt their behaviour from role models. • Bandura Ross and Ross (1963) found that children who saw a cartoon character being aggressive had a mean total of 99 aggressive acts	
	compared to a control group who had a mean total of 54 aggressive acts. • Social learning theory ignores the influence of biology, such as damage to the pre-frontal cortex, on aggressive behaviour so it is not a complete explanation of aggression. **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 evaluation/conclusion in their answer. Application to the context 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 & 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	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 & 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	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 & 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	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 evaluation, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments, presenting a balanced conclusion. (AO3)

Q30.

Question Number	Indicative content	Mark
	AO1 (6 marks), AO2 (4 marks), AO3 (6 marks) **AO1** • It was thought that XYY syndrome caused aggression in males that had an extra Y chromosome which is the male chromosome. • If the MAOA gene is dysfunctional it stops noradrenaline, serotonin and dopamine from being broken down. • If the MAOA gene stops neurotransmitters such as noradrenaline being broken down then the person could become more sensitive to the flight or fight response and so become more aggressive. • Social learning theory says that we will copy the aggressive actions a role model if they have been vicariously reinforced for the aggressive behaviour. • In order to learn aggressive behaviour, we must observe the behaviour and notice the different actions needed for the specific aggressive behaviour. • People have to be motivated to imitate a behaviour, which may in the form of the role model receiving a reward or the imitator receiving a reward once they have imitated the aggression. **AO2** • Berengaria's father may have an extra Y chromosome which makes him more aggressive and explain why he was in the fight that resulted in him going to prison. • Berengaria's mother may have a dysfunctional MAOA gene which leads to an increase in adrenaline so she goes into fight mode when with the neighbours and has arguments with them. • The film actress is a role model to Berengaria as she is of the same gender, so Berengaria is more likely to imitate her kick boxing as the film actress has relevance to her. • The phone that was allegedly stolen by Berengaria would act as a reinforcement for her, as she could sell it and gain money to spend on something she wanted.	**(16)**

	AO3 • The XYY syndrome only occurs in males so it does not explain why females are aggressive, as females do not have a Y chromosome, so it is not a complete explanation of aggression. • McDermott (2008) found that those with low MAOA activity were more likely to give hot sauce to an opponent who had stolen their earnings so supporting that genes affect aggression. • A dysfunctional MAOA gene affects neurotransmitters, which then affect aggression so genes on their own do not explain aggressive behaviour. • Bandura Ross and Ross (1961) found that children who saw an adult model being aggressive to a Bobo doll were more likely to be aggressive towards the Bobo doll than children who did not see an aggressive model, so social learning theory can explain aggression. • Bandura's studies on aggression involved young children so social learning theory may not apply to adults as they may be able to think of other ways to deal with a situation. • Anderson and Murphy (2003) found that females who played Street Fighter gave more blasts of loud noise to their opponents than those who play Lemmings showing that social learning theory may affect aggression. **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 evaluation/conclusion in their answer. Application to the context 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 & 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	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 & 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	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 & 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	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 evaluation, containing logical chains of reasoning throughout. Demonstrates an awareness of competing arguments, presenting a balanced conclusion. (AO3)

Q31.

Question Number	Indicative content	Mark
	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.	**(16)**
	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.	
	• 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)

Q32.

Question Number	Indicative content	Mark
	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)

Q33.

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

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)

Q34.

Question Number	Answer	Mark
(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
(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 $n(n^2-1)$ = 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
(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
(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)**

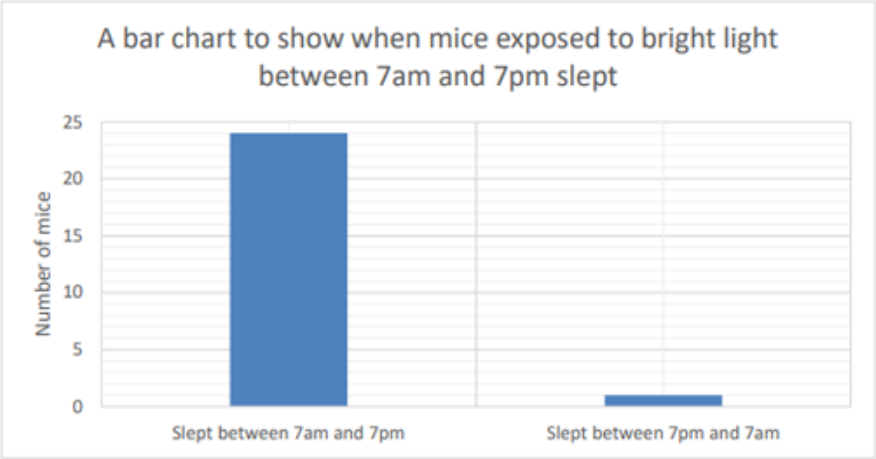
Q35.

Question Number	Answer	Mark
(a)	**AO1 (2 marks)** Credit **one** mark for each accurate aim given. For example: • Brendgen et al. (2005) aimed to find out the extent to which social aggression could be explained by genetic factors, shared environmental factors or nonshared environmental factors (1). • They aimed to investigate to what extent the covariance between physical and social aggression could be explained by genetic, shared or nonshared environmental factors (1). **Look for other reasonable marking points.**	**(2)**

Question Number	Answer	Mark
(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 • 234 pairs of twins were used which is a large sample size so may increase the representativeness of the results (1), as any anomalies in the results on aggression and twin pairs are less likely to have an effect on the overall results (1). Weakness • The twins were all aged 6-years old with an average age of 72.7 months so the results may not be true for older children (1), especially as social aggression is not fully developed until 8-years-old so the results are not representative of social aggression at a later age (1). **Look for other reasonable marking points.**	**(4)**

Q36.

Question Number	Answer	**Mark**
(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
(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
(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
(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)**

Q37.

Question Number	Answer	Mark
(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
(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)**

Q38.

Question Number	Answer	Mark
(a)	**AO2 (2 marks)** Credit **two** marks for a fully operationalised non-directional hypothesis. Credit **one** mark for a partially operationalised non-directional hypothesis. For example: • There will be a relationship between the numbers of hours spent playing computer games in a day and the quality of sleep from 1, very poor quality, to 7, excellent quality (2). • There will be a relationship between the amount of time spent playing computer games and the quality of sleep (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(b)	**AO2 (4 marks)** Credit **one** mark for a correct calculation of total for d^2 = **61.5** Credit **one** mark for a correct calculation of 6 x61.5 times the sum of d^2 = **369** Credit **one** mark for a correct calculation of $369/6x(6^2-1)$ 6 times the sum of d^2 divided by $n(n^2-1)$ = **1.76** Credit **one** mark for a correct answer to two decimal places 1-1.76 = **-0.76**	**(4)**

Number of hours a day spent playing computer games	Rank 1	**Quality of sleep**	Rank 2	*d*	d^2
2	2.5	6	5.5	-3	**9**
3.5	4	5	4	0	**0**
6	6	3	2	4	**16**
4	5	2	1	4	**16**
2	2.5	4	3	-0.5	**0.25**
1	1	6	5.5	-4.5	**20.25**
				Total for d^2	**61.5**

Look for other reasonable marking points.

Question Number	Answer	Mark
(c)	**AO2 (1 mark), AO3 (1 mark)** Credit **one** mark for accurate identification of one reason in relation to the scenario (AO2) Credit **one** mark for justification/exemplification of the reason (AO3) For example: • Herbert used ordinal data for his study on the relationship between the number of hours spent playing computer games and the quality of sleep (1), as he measured quality of sleep using a scale so two participants may have the same quality of sleep but give it a different score (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

Question Number	Answer	Mark
(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: • Herbert cannot determine a cause and effect between the number of hours spent playing a computer game and the quality of sleep (1), as it may be that those who have poor quality of sleep spend longer on computer games due to their quality of sleep or vice versa (1). **Look for other reasonable marking points.** **Generic answers score 0 marks.**	**(2)**

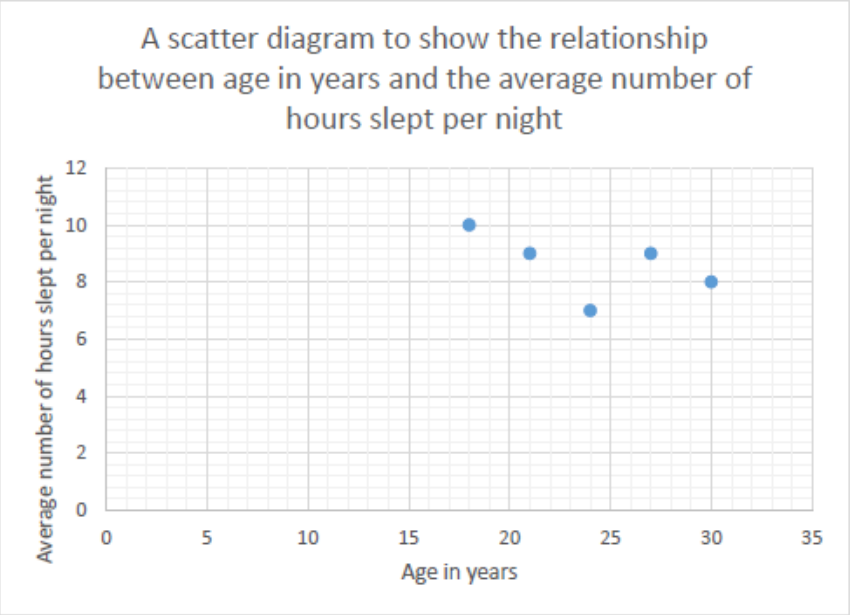
Q39.

Question Number	Answer	Mark
a	**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
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: • 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)**

Q40.

Question Number	Answer	**Mark**
(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
(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
(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)**