

Mark schemes

Q1.

[AO1 = 4 AO3 = 4]

Level	Mark	Description
4	7-8	Knowledge of the biological approach is accurate with some detail. Evaluation is effective. Minor detail and/or expansion is sometimes lacking. The answer is clear and coherent. Specialist terminology is used effectively.
3	5-6	Knowledge of the biological approach is evident but there are occasional inaccuracies/omissions. There is some appropriate evaluation. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.
2	3-4	Limited knowledge of the biological approach is present. Focus is mainly on description. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1-2	Knowledge of the biological approach is very limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

- human behaviour can be explained using biology, eg genes, biochemistry, brain physiology etc
- genetic basis of behaviour, eg the relationship between genotype and phenotype
- the human nervous system, eg the role of the ANS in the fight or flight response
- structure and function of the brain including localisation of brain functions and subsequent behaviours
- neurotransmitters and hormones with example(s) of how these affect behaviour, eg the role of low levels of serotonin in OCD
- evolution and the importance of natural selection, eg potential adaptive advantage of genes linked to OCD.

Possible evaluation:

- real life application, eg the use of drugs to counteract neurotransmitter imbalance with examples of these and their benefits
- use of scientific methods might reduce behaviours to unrealistic actions and therefore underplay the possible impact of factors such as cognition and environment on behaviour
- the danger of looking for biological cause of all behaviours has led to problems, eg the search for the 'criminal gene'
- difficulty separating the impact of both nature and nurture – the positive contributions of other approaches in psychology

- emphasis on scientific methods – rigour of experimentation, scanning techniques, twin and family studies with examples of these
- using the experimental method involves a high level of control, allows inference of cause and effect/increases reliability and validity of conclusions drawn
- comparisons with other approaches.

Credit other relevant content such as reference to debates like reductionism and determinism.

[8]

Q2.

[AO1 = 3]

3 marks for a clear and coherent outline of an example of how neurotransmitter(s) influence behaviour with some elaboration.

2 marks for an outline of an example of how neurotransmitter(s) influences behaviour that lacks the clarity and/or detail of the 3-mark answer.

1 mark for a naming a neurotransmitter with a relevant behaviour.

Possible content:

- reference to specific neurochemicals and their effects, eg dopamine regulates motor behaviour/plays a role in brain's reward system; serotonin regulates appetite/sleep/memory/mood/muscle contraction
- imbalances of neurochemicals have been linked to abnormal behaviour/mental illnesses, eg low serotonin and OCD, high or low dopamine and schizophrenia
- the mode of action of psychoactive drugs, eg SSRIs to reduce anxiety and thereby reduce compulsive behaviour.

Credit other relevant content.

[3]

Q3.**[AO2 = 4]**

Level	Marks	Description
2	3-4	The explanation of possible reasons why Ellie and Lucy had different scores using knowledge of genotype and phenotype is clear with some accurate detail. The answer is generally coherent with effective use of appropriate terminology.
1	1-2	The explanation of possible reasons why Ellie and Lucy had different scores using knowledge of genotype and/or phenotype has limited detail. The answer lacks coherence and use of appropriate terminology.
	0	No relevant content.

Possible content:

- Ellie and Lucy have identical genes which code for different aspects of intelligence because they are identical twins with the same genotype
- The twins' genotypes are not expressed in their outward behaviour/scores on the test.
- Ellie's and Lucy's phenotypes are different as they achieved different scores on the intelligence test suggesting Ellie might be more intelligent/better at intelligence tests than Lucy
- Ellie's and Lucy's phenotypes might be influenced by environmental factors such as different teachers at school or different learning experiences which could account for their different scores.

Credit other relevant application.

[4]

Q4.**[AO2 = 4]**

Level	Marks	Description
2	3-4	Explanation of the biological approach to the differing attitudes of the daughters is clear and mostly accurate. The material is applied appropriately. The answer is generally coherent with effective use of terminology.
1	1-2	Some explanation of the biological approach to the differing attitudes of the daughters is evident. Application is limited. The answer lacks accuracy and detail. Use of terminology is either absent or inappropriate. Responses which only refer to either Steph's or Georgie's daughters can be awarded a maximum of 2 marks.
	0	No relevant content.

Possible content:

- Steph's and Georgie's daughters' different responses to their schoolwork may arise from their differing genotypes
- Steph's daughter may have inherited genes from her mother which make her more resilient/resistant to stress, etc. The different set of genes Georgie's daughter received from her mother may account for the different attitudes the girls have to their schoolwork
- differences in neurochemistry may cause Steph's daughter to receive higher rewards for succeeding in her schoolwork than Georgie's daughter or may make Georgie's daughter receive higher levels of anxiety
- differences in biological structures may account for the differing attitudes.

Credit other relevant material.

[4]

Q5.**[AO2 = 4]**

Level	Mark	Description
2	3-4	Application of knowledge of the genotype and phenotype is clear and mostly accurate. The answer is generally coherent with effective use of terminology.
1	1-2	Some application of the genotype and phenotype is evident. The answer lacks accuracy and detail. Use of terminology is either absent or inappropriate.
	0	No relevant content.

Possible content:

- Lily and Jemima have identical genotypes (genotype refers to the genetic make-up of an individual)
- Lily and Jemima do not have identical phenotypes (phenotype refers to the observable characteristics of an individual as a result of their genotype and their environment)
- although Lily and Jemima have the same genes, Jemima might practice netball more or have started lessons earlier than Lily, these environmental factors may make her better at netball
- although Lily and Jemima have the same genes, Jemima might have a different skin care routine/diet/sun exposure/etc than Lily, these environmental factors may make her skin clearer than Lily's.

[4]

Q6.**[AO1 = 3 AO3 = 5]**

Level	Marks	Description
4	7-8	Knowledge of cognitive neuroscience is accurate with some detail. Discussion is thorough and effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear, coherent and focused. Specialist terminology is used effectively.
3	5-6	Knowledge of cognitive neuroscience is evident but there are occasional inaccuracies/omissions. Discussion is mostly effective. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is used appropriately.
2	3-4	Limited knowledge of cognitive neuroscience is present. Focus is mainly on description. Any discussion is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1-2	Knowledge of cognitive neuroscience is very limited. Discussion is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

- cognitive neuroscience aims to explore the neurobiological basis of thought processes and disorders
- cognitive neuroscience has emerged with improvements in technology such as fMRI and PET scans
- cognitive science was formally formed in MIT in 1956 and cognitive neuroscience was coined by George Miller and Michael Gazzaniga in the 1970s.

Possible discussion points:

- more scientific/objective in research study
- nature/nurture debate – cognitive neuroscience has demonstrated the brain's plasticity throughout life supporting the role of experience
- free will/determinism debate – cognitive neuroscience demonstrates the role of experience in shaping the brain showing biology is not destiny
- research studies identifying the neurological basis of mental processes, eg Tulving (1994) PET scan study on memory, Burnett et al. (2009) neurological network associated with guilt
- provided neurobiological basis of certain psychological disorders (eg role of the parahippocampal gyrus in OCD) resulting in the development of new therapeutics and removing blame and stigma
- ethics, eg controversial use of mind mapping for lie detection in courts

- early identification for cognitive problems prior to observable behaviour has provided potential for early intervention
- provides evidence to support previously controversial behavioural findings by illuminating mechanisms of cognitive development that underlie behavioural observations.

Credit other relevant material.

[8]

Q7.

[AO1 = 4]

Level	Marks	Description
2	3-4	Outline of what is meant by cognitive neuroscience is clear and has some detail. The answer is generally coherent with effective use of terminology.
1	1-2	Outline of what is meant by cognitive neuroscience lacks clarity and/or detail. The answer as a whole is not clearly expressed. Terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

- scientific study of brain/neurological structures, mechanisms, processes, chemistry that are responsible for cognitive/mental/thinking processes
- the use of scanning techniques
- the study of neurotypical individuals to locate the physical basis of cognitive processes in the brain
- use of examples.

Credit other relevant information.

[4]