Chromosomes and Hormones - Mark Scheme

Q1.

[AO1 = 3]

1 mark for a correctly named syndrome (Klinefelter's or Turner's)

Plus

2 marks for clear and coherent outline of the syndrome

OR

1 mark for a vague or muddled outline of the syndrome

0 marks for an outline that does not match the named syndrome

Possible content:

- Klinefelter's – sex chromosome pattern of XXY, associated with cognitive difficulties eg dyslexia and behavioural passivity.
- Turner's – sex chromosome pattern of XO, associated with high level of verbal skill.

Credit other relevant psychological or physical characteristics.

Q2.

(a) **[AO1 = 1]**

One mark for knowledge of a relevant difference.

Likely differences: chromosomal make up; size of genitalia; limb length; differences in timings of language development, temperament, passivity, shyness etc.

Accept other valid differences.

(b) **[AO3 = 2]**

One mark – for comparison with individuals with typical sex chromosome patterns.
One mark – inferences may be made of a chromosomal / biological basis / nature-nurture regarding gender development should there be differences found between atypical and typical sex chromosome individuals.

Credit answers that focus on therapeutic value.

Q3.

[AO1 = 1, AO2 = 1]

AO1

One mark for a relevant limitation.

AO2

One mark for how / why it is a limitation.

Likely limitations: reductionist; crude to suggest differences in complexity of gender are a result of chromosomes; underemphasises nurture / role of the environment; comparison with other explanations may receive credit eg social learning theory only if **used** to elaborate or explain the limitation etc.

Accept reasoned argument of limitation of the use of animals for testing influences on gender development such as difficulty of generalising results.

Q4.

[AO2 = 4]

Level	Marks	Description
2	3 – 4	Outline of Klinefelter's syndrome and Turner's syndrome is mostly clear and accurate. The knowledge is applied appropriately to both cases. The answer is generally coherent with effective use of terminology. For 4 marks the sex chromosome patterns for both syndromes should be correct.
1	1 – 2	There is limited/partial knowledge of Klinefelter's syndrome and/or Turner's syndrome. There is some appropriate application. The answer may lack coherence. Use of terminology may be either absent or inappropriate. OR one syndrome at Level 2.
	0	No relevant content.

Application to Ben

- Ben is male – Klinefelter's syndrome is a chromosomal disorder occurring in males with an extra X chromosome (XXY pattern)
- school problems mentioned by Ben's mum might include: problems reading and writing; a tendency to get upset/depressed easily; passivity compared to other boys
- physical differences referred to by Ben's mum might include: extra height/long legs, small testes, lacking facial hair.

Application to Dido

- Dido is female – Turner's syndrome is a chromosomal disorder occurring in females with a missing X chromosome (XO pattern)
- effects at school mentioned by Dido's mum might include: good language skills/reading
- physical effects referred to by Dido's mum might include: short stature, no breast development, short neck, later infertility

Credit other characteristics found in Klinefelter's and Turner's that are relevant to the scenario/stem.

Q5.

Marks for this question: AO1 = 6, AO3 = 10

Level	Marks	Description
4	13 – 16	Knowledge is accurate and generally well detailed. Discussion / evaluation / application is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	9 – 12	Knowledge is evident. There are occasional inaccuracies. Discussion / evaluation / application is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places.
2	5 – 8	Some knowledge is present. Focus is mainly on description. Any discussion / evaluation / application is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions. One explanation at Level 4
1	1 – 4	Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used. One explanation at Level 3
	0	No relevant content.

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

AO1

Marks for accurate description of the explanations of gender development provided by biological theory and social learning theory (SLT).

Biological: Students may focus on some of the following: how genetic factors cause gender-appropriate behaviour – gender and sex are interrelated; hormones, eg the influence of androgens and testosterone Dabbs et al (1995), Tricker et al (1996) or oestrogen and progesterone Van Goozen et al (1995), Hampson and Kimura (1988);
atypical sex chromosomes, eg XXY – Klinefelter's syndrome; XO – Turner's syndrome – in terms of the effect these syndromes have on gender development.
Students may choose to focus on non-human research, eg Gorski et al (1980) found male rats' sexually dimorphic nucleus (SDN) to be larger in anatomical structure compared to female rats' SDN which might account for differences in behaviour, or

on case studies such as Imperato-McGinley et al (1978) or Money and Erhardt (1972), Diamond (1997).
SLT: the idea that gender behaviour is learned via observation in social contexts; the influence on gender development of cognitive processes – including some of the following, attention, retention and motivation, reproduction; modelling, Perry and Bussey (1979) and identification; imitation, Masters et al (1979) and reinforcement, Fagot (1978), Dweck et al (1978), Smith and Lloyd (1978) / Baby X studies.

AO3

Marks for discussion of the two explanations.
Students are required to refer to evidence in their response. This may be in support / conflict for either approach. For example, Money (1975) suggested that nurture was responsible for gender development thereby rejecting nature / biology. However, in a follow-up study Diamond (1997), Brenda had never felt happy as a girl and resumed her masculine identity (nature), thereby supporting biological explanations. Students may raise methodological issues associated with the extrapolation of findings from animal research to explain human gender development. They may reflect on the value of unusual case study evidence in a universal explanation of gender development; the issue of cause and effect in testosterone research and the possible impact of environmental factors on biological state. Similarly for SLT weaknesses in the evidence as well as strengths might be considered – the artificiality of laboratory-based research; weaknesses in the explanation of age-related changes or differences in gender behaviours, despite the same environment, and discussion of how these issues might be explained as due to cognitive factors mediating the responses / chosen behaviours.

Credit comparisons with other approaches only if the comparison makes clear the way in which the value of the biological or SLT approach is evident or how either approach is weakened by such comparison.
Credit reference to debates when it is made clear how these impact on strengths or limitations of each explanation.
Credit use of evidence.