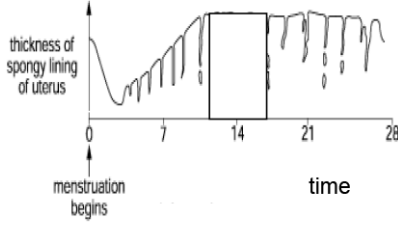



Mark scheme – The Endocrine System (F)

Question			Answer/Indicative content	Marks	Guidance
1			B ✓	1 (AO2.1)	
			Total	1	
2			B ✓	1 (AO2.1)	
			Total	1	
3			C ✓	1 (AO 1.1)	
			Total	1	
4			C ✓	1 (AO 2.2)	<p><u>Examiner's Comments</u></p> <p>The question assessed understanding of results from practical experiments on phototropism and the way light affects the tip of a growing shoot. Most candidates made a choice between A and D. Clearly there is a misconception that plants will show phototropic responses even when the tip is covered. Alternatively, they may have misunderstood the purpose of the light-proof cap. This could be used as a focus when teaching about phototropism.</p>
			Total	1	
5	a		flower opening ✓ germination ✓ shedding of leaves ✓	3 (AO 1.1)	<p><u>Examiner's Comments</u></p> <p>This AO1.1 question rarely scored full marks. Often candidates scored 1 or sometimes 2 marks but there was no obvious pattern to which ones they got correct.</p>

	b	i	<p>plant B has grown in the direction of/towards the light source ✓</p> <p>tropic response is positive ✓</p>	<p>2 (AO 3.1a)</p>	<p>ALLOW in plant A it is still showing phototropism to the light source above</p> <p>IGNORE movement</p> <p>ALLOW positive phototropism is correct</p> <p><u>Examiner's Comments</u></p> <p>This AO3.1 question did see most candidates score at least 1 mark. This was identifying that the sister had said it was 'positive'. Candidates sometimes did not gain credit on the first marking point because they did not give any indication it was growth of the plant to the light source.</p>
		ii	<p>auxin ✓</p>	<p>1 (AO 1.1)</p>	<p>ALLOW IAA/indole acetic acid</p> <p><u>Examiner's Comments</u></p> <p>Again, this AO1.1 recall question was reasonably well answered, although there was some confusion with some candidates putting insulin.</p>
	c	i	<p>FSH ✓</p> <p>follicle ✓</p> <p>progesterone ✓</p>	<p>3 (AO 1.1)</p>	<p><u>Examiner's Comments</u></p> <p>This AO1.1 recall question discriminated well, and a full range of responses were seen. The most common correct response where only 1 mark was scored was progesterone. Fetus rather than follicle was seen quite often.</p>
		ii	<p>Days 3 – 6 ✓</p>	<p>1 (AO 2.2)</p>	<p><u>Examiner's Comments</u></p> <p>This AO2.2 question testing mathematical skills did gain credit with higher ability candidates. The most common incorrect answer was 4-7 days.</p>
	d		<p>Any three from:</p> <p>mitosis ✓</p>	<p>3 (AO 1.1)</p>	

			<p>DNA replicates ✓</p> <p>chromosomes separate ✓</p> <p>cells divide into two new cells ✓</p> <p>cells grow ✓</p>		<p>ALLOW chromosomes are copied</p> <p>ALLOW DNA duplicates/doubles</p> <p>ALLOW (identical) daughter cells produced each with own copy of chromosomes</p> <p>ALLOW cell splits into two</p> <p><u>Examiner's Comments</u></p> <p>A large number of candidates found this AO1.1 question about cell division challenging and did not identify it as asking about how new cells are made, so did not make the link to cell division. Many described how the menstrual cycle was controlled by hormones and how they affected the thickness of the lining. There were some very good responses from those candidates that recognised this was about cell division but some mentioned meiosis rather than mitosis.</p>
			Total	13	
6	a		<p>brain✓</p> <p>egg✓</p> <p>oestrogen✓</p> <p>progesterone✓</p>	<p>4</p> <p>(AO 4 x 1.1)</p>	<p>ALLOW estrogen</p> <p><u>Examiner's Comments</u></p> <p>Here AO1.1 recall was assessed for the role of hormones in the menstrual cycle. Most candidates gained one mark for the egg. Some also identified the brain and some got all four marks. However, occasionally candidates unfortunately got the two hormones the wrong way around.</p>
	b	i	<p>letter E marked on day 14✓</p>	<p>1</p> <p>(AO 2.1)</p>	 <p>21400032</p>

				<p>tolerance area inside white box</p> <p><u>Examiner's Comments</u></p> <p>Candidates had to apply their knowledge to the diagram. Many candidates gained credit within the tolerance limits. However, there were many no responses, and this is something that candidates should avoid on this type of question.</p>  <p>Examination technique should encourage them to put the letter somewhere on the diagram, even if they are not sure of the correct response.</p>
	ii	lining breaks down / is shed✓	<p>1 (AO 1.1)</p> <p><u>Examiner's Comments</u></p> <p>This AO1.1 question assessed recall of events during the menstrual cycle. Candidates generally answered this question successfully.</p>	<p>ALLOW menstruation / a period occurs ALLOW unthickens/thickness reduces/gets thinner/decreases</p>
	c	<p>mark scheme for guidance on how to mark this question.</p> <p>Level 3 (5–6 marks)</p> <p>Applies knowledge of hormonal and one non–hormonal method of contraception. AND Interprets data to explain more than one difference in effectiveness between hormonal and non–hormonal contraceptives. AND Makes at least one judgement to explain why the pill is a popular method of contraception. <i>There is a well–developed line of</i></p>	<p>6 (AO 2 x 2.1) (AO 2 x 3.1a) (AO 2 x 3.2a)</p>	<p>AO2.1 Apply knowledge and understanding of methods of contraception.</p> <ul style="list-style-type: none"> • Sterilisation prevents the release of sperm • Hormonal methods prevent ovulation • Diaphragm / condom prevent sperm meeting egg / are barrier methods <p>AO3.1a Analyse information and ideas to interpret the data to explain differences between effectiveness of contraceptives.</p>

		<p><i>reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) Any two of: Applies knowledge of hormonal and one non-hormonal method of contraception.</p> <p>OR Interprets data to explain one difference in effectiveness between hormonal and non-hormonal contraceptives.</p> <p>OR Makes at least one judgement to explain why the pill is a popular method of contraception. <i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) Applies knowledge of at least one hormonal and one non-hormonal method of contraception.</p> <p>OR Interprets data to explain at least one difference in effectiveness between hormonal and non-hormonal contraceptives.</p> <p>OR Makes at least one judgement to explain why the pill is a popular method of contraception.</p> <p><i>There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.</i></p> <p>0 marks <i>No response or no response worthy of credit.</i></p>	<ul style="list-style-type: none"> • hormonal methods more reliable than non-hormonal barrier methods • due to (named) hormonal methods being easy to use/less awkward in use • (named) non-hormonal barrier methods less reliable as awkward in use • non-hormonal methods show more variation in reliability <p>AO3.2a Analyse information and ideas to make judgements to explain why the pill is a popular method.</p> <ul style="list-style-type: none"> • pill is easier to use than the patch/injectable so preferable to the safer injection • much more reliable than condom/diaphragm but easier to reverse decision than sterilisation <p><u>Examiner's Comments</u></p> <p>This Level of Response question assessed application, AO2, and analysing information, interpreting and forming judgements, AO3. To be successful in this question it was important that candidates gave a balanced response that covered all assessment objectives. Candidates were able to demonstrate some understanding of the types of contraception. Many were able to justify the use of the pill as a hormonal method that was relatively easy to use compared to other forms of hormonal contraception. Some candidates understood how hormonal methods worked and others knew the action of non-hormonal barrier methods, but it was very rare to see candidates who described the action of both hormonal and non-hormonal methods.</p>
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					The most common error in interpreting the data in the table was to assume the one with the highest number was the most reliable. Where candidates were awarded Level 2, this was usually because they had analysed and interpreted the data in the table and used this to form a judgement as to why the pill was a popular method of contraception.
	d		in the blood(stream)✓	1 (AO 1.1)	Examiner's Comments The question assessed AO1.1 recall of hormone transport. Although candidates generally answered this successfully, some did not gain marks because their response was a specific blood cell either red or, in some cases, white. Clear misunderstanding was demonstrated by candidates whose response referred to the nervous system.
			Total	13	
7	a	i	<p style="text-align: right; font-size: small;">21406032</p>		before / around day 14
		i	line rises and falls (1)	1	
		i	peaks before progesterone (1)	1	
		ii	FSH stimulates oestrogen production (1)	1	
		ii	oestrogen inhibits FSH production (1)	1	
	b		<p>* Please refer to the marking instructions point 10 for guidance on how to mark this question.</p> <p>Level 3 (5–6 marks) An explanation as to how the effects of endometriosis could be relieved by treatment with progesterone.</p>	6	<p>AO3.1b: Analysis of the information and evaluation of the effect of the treatment</p> <ul style="list-style-type: none"> • To stop the cells building up oestrogen levels should be kept low • Cell build up can be reduced by keeping progesterone levels high

			<p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) An explanation of the effects of the levels of oestrogen and progesterone levels and their effect on the endometrial cells outside the uterus.</p> <p><i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) Draws a simple explanation of how the hormones affect the endometrial cells.</p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p>0 marks <i>No response or no response worthy of credit.</i></p>		<ul style="list-style-type: none"> • Progesterone can be given as a (contraceptive) pill to maintain high levels of progesterone • Progesterone mimics pregnancy and halts the menstrual cycle <p>AO2.1: Applying knowledge of hormone levels to endometriosis / endometrial cells</p> <ul style="list-style-type: none"> • An explanation that when oestrogen levels are high the levels of progesterone are low • An explanation that the (endometrial) cells outside the uterus would build up and breakdown as normal • An explanation that during the breakdown stage the cells would not be able to leave the body in the normal way <p>AO1.1: Demonstrate knowledge and understanding of the female sex hormones and menstruation</p> <ul style="list-style-type: none"> • A simple explanation of the effect of oestrogen on the cells of the womb during menstruation from the graph e.g. builds up the cell lining of the uterus • A simple explanation of the effect of progesterone on the cells of the womb during menstruation from the graph e.g. maintains the cell lining of the uterus
			Total	10	
8			D	1	
			Total	1	
9			C	1	

			Total	1	
10			D	1	
			Total	1	
11			B	1	
			Total	1	