

Question Number	Answer	Additional Comments	Mark												
4(b)(i)	<ol style="list-style-type: none"> 1. percentage of seedlings (showing totipotency) decreases as age increases up to 21 days / negative correlation up to 21 days / eq ; 2. as age increases { after 21 / from 21-28 / at 28} days percentage of seedlings showing totipotency increases / eq ; 3. 28 days is an anomalous result ; 4. credit correct manipulation of the data ; 	<p>4. Some examples are shown below</p> <table border="1"> <thead> <tr> <th>Days</th> <th>Difference (%)</th> </tr> </thead> <tbody> <tr> <td>7-28</td> <td>(76-60) 16</td> </tr> <tr> <td>7-14</td> <td>(76-56) 20</td> </tr> <tr> <td>7-21 – <i>mp1</i></td> <td>(76-40) 36</td> </tr> <tr> <td>14-21</td> <td>(56-40) 16</td> </tr> <tr> <td>21-28 – <i>mp2</i></td> <td>(40-60) (+) 20</td> </tr> </tbody> </table> <p>IGNORE calculated percentage of percentage</p>	Days	Difference (%)	7-28	(76-60) 16	7-14	(76-56) 20	7-21 – <i>mp1</i>	(76-40) 36	14-21	(56-40) 16	21-28 – <i>mp2</i>	(40-60) (+) 20	(2)
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4(b) (ii)	<ol style="list-style-type: none"> { repeats / larger number of seedlings } { at each age / in each group } / eq ; more ages of seedlings used / use seedlings older than 28 days / test 35 day old seedlings / eq ; repeat 28-day group / repeat any anomalous results / eq ; 	1. ACCEPT repeated the whole experiment	(2)

Question Number	Answer	Additional Comments	Mark
4(c) (i)	as phenol concentration increases from { 7 to 21 / 7 to 14 / 14 to 21 } days, percentage of seedlings showing totipotency decreases / negative correlation up to 21 days / eq ;		(1)

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4(c) (ii)	(as phenol concentration increases) at 28 days percentage of seedlings showing totipotency increases / eq ;	ACCEPT reference to after 21 days	(1)

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4(d)	<ol style="list-style-type: none"> totipotent cells can { give rise to / differentiate to become } { any cell / extra embryonic tissues / eq } ; pluripotent cannot { give rise to / differentiate to become } { all cells in the body / extra embryonic tissues / eq } ; idea that only totipotent cells can give rise to other totipotent cells ; idea that totipotent cells can give rise to an entire human being, pluripotent cells cannot ; 	<p>NOT 'turns into', 'becomes', 'develops into' but penalise once only</p> <ol style="list-style-type: none"> ACCEPT specialised for differentiated 1 & 2 IGNORE reference to embryonic cells/tissues unless it makes the response incorrect, ACCEPT placental cells/tissues ACCEPT can give rise to most cells 	(2)