

Question Number	Answer	Additional Comments	Mark												
4(b)(i)	<div>1. percentage of seedlings (showing totipotency) decreases as age increases up to 21 days / negative correlation up to 21 days / eq ;</div> <div>2. as age increases { after 21 / from 21-28 / at 28} days percentage of seedlings showing totipotency increases / eq ;</div> <div>3. 28 days is an anomalous result ;</div> <div>4. credit correct manipulation of the data ;</div>	<div>4. Some examples are shown below</div> <table><tr><td>Days</td><td>Difference (%)</td></tr><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></table> <div>IGNORE calculated percentage of percentage</div>	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)
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														

Question Number	Answer	Additional Comments	Mark
4(b) (ii)	<ol style="list-style-type: none"> 1. { repeats / larger number of seedlings } { at each age / in each group } / eq ; 2. more ages of seedlings used / use seedlings older than 28 days / test 35 day old seedlings / eq ; 3. 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)

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

Question Number	Answer	Additional Comments	Mark
4(d)	<ol style="list-style-type: none"> 1. totipotent cells can { give rise to / differentiate to become } { any cell / extra embryonic tissues / eq } ; 2. pluripotent cannot { give rise to / differentiate to become } { all cells in the body / extra embryonic tissues / eq } ; 3. idea that only totipotent cells can give rise to other totipotent cells ; 4. 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"> 1. ACCEPT specialised for differentiated 1 & 2 IGNORE reference to embryonic cells/tissues unless it makes the response incorrect, ACCEPT placental cells/tissues 2. ACCEPT can give rise to most cells 	(2)