

B2 Cell division and stem cells mark scheme

| Question | | | Marking details | Marks Available | | | | |
|---|---------------------------|-----|---|-----------------|--------------|---|---------------------------|---|
| 1 | a | i | Nucleus | 1 | | | | |
| | | ii | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">46,46;</td> <td style="width: 50%; padding: 2px;">23,23,23,23;</td> </tr> <tr> <td style="padding: 2px;">Growth/replacement of {worn out/damaged/old} cells/repair damaged tissue; NOT producing new cells</td> <td style="padding: 2px;">Different/ non identical;</td> </tr> </table> | 46,46; | 23,23,23,23; | Growth/replacement of {worn out/damaged/old} cells/repair damaged tissue; NOT producing new cells | Different/ non identical; | 4 |
| 46,46; | 23,23,23,23; | | | | | | | |
| Growth/replacement of {worn out/damaged/old} cells/repair damaged tissue; NOT producing new cells | Different/ non identical; | | | | | | | |
| | | iii | Gametes | 1 | | | | |
| 2 | a | | <p>Stem cells are <u>undifferentiated</u> stem cells that have the capacity to <u>develop into specialised</u> cells. Stem cells are able to treat damaged or diseased tissue, (providing a potent medical tool).</p> | 2 | | | | |
| | | | <p>(Obama) believes that embryonic stem cell research will lead to the {treatment/cure} of many diseases/treat {damaged tissue/or correct example} (OWTTE) Benefit (no rejection/no need to find a donor/ no need for tissue typing)</p> | 2 | | | | |
| | | | <p>(Gingrich) – reference to the ethical issues involved e.g. destruction of {embryos/foetus/<u>unborn</u> children}/life is lost/destroying (potential human) life: NOT – playing God</p> | 1 | | | | |
| | B | i | <u>Stem</u> cells | 1 | | | | |
| | | ii | <p>Avoids ethical issues of { using/killing } {unborn children/embryos/foetus}/ Cells more likely to be accepted by the body/less likelihood of rejection: NOT less chance of transfer of disease/nothing is killed/less controversial unqualified</p> | 1 | | | | |
| 3 | a | | There are {46 chromosomes/(23) pairs/ has a diploid number/not haploid/has both X and Y: | 1 | | | | |
| | b | | No {corresponding/matching} part of chromosome (for paired allele)/only has one X chromosome/ only has one {copy of the gene/allele}: | 1 | | | | |
| | c | | Linearly/in a line/in a row | 1 | | | | |
| 4 | a | | D | 1 | | | | |
| | b | | 75 hours | 2 | | | | |
| | | | Incorrect answer/no answer written 5 x 15 (hours) | (1) | | | | |

| | | | |
|---|--|--|--|
| 5 | | <p>Indicative content:</p> <p>Mitosis</p> <ul style="list-style-type: none"> • (genetically) identical cells produced • Two daughter cells • One division • Diploid daughter cells • Identical set of chromosomes • Occurs in the formation of body cells • For growth and repair (of body tissues) <p>Meiosis</p> <ul style="list-style-type: none"> • (genetically) non-identical cells • four daughter cells • half the number of chromosomes • occurs in the formation of gametes (sex cells) • For sexual reproduction • Results in genetic variation <p>5-6 marks</p> <p>The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks</p> <p>The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks</p> <p>The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. 0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p> | |
|---|--|--|--|

