**KELMSCOTT SENIOR HIGH SCHOOL**

Scientific Inquiry 3: Unit 4 Human Biology 2016

**Biotechnological techniques MARK KEY**

Please answer the following questions. You may use the Investigation 3 homework sheets you prepared to help you with your answers. You may continue your answers on the back of the sheet if you run out of room but this must be clearly indicated!

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- |
| Questions | Marks possible | Marks Achieved |
| 4 | 35 |  |

1. a i

TATGACCG

ii

AUACUGGC

b

* The section of DNA you want to sequence is isolated
* 4 test tubes are prepare containing one of tagged A, tagged G, tagged C, tagged T
* PCR is performed on these tubes
* A gel is prepared and A loaded in one well, C loaded on another, G in another, T in another
* Electricity Is applied, DNA moves to the positive end
* Fragments are separated according to size/smallest travel the farthest
* Sequence is read from the smallest fragment to the largest to give the sequence

Any 5

c

* Show evolutionary relationships
* Identify disease genes/ function of genes
* Personalise drug treatments

Any two (or another that is reasonable and linked to the syllabus)

2a

BEF

b

They all were

c

* They share many of the same bands
* All share 1,4 and 9
* Known family history?

d

* Could start monitoring breast health early to identify any change
* Could undergo preventative mastectomy
* Could change lifestyle to limit mutagens

3a

* A piece of DNA that codes for a protein/trait

b

* Restriction enzymes
* To cut the DNA fragment into many different lengths

c

* DNA sequencing is when the exact nucleotide sequence of a piece of DNA is determined
* DNA profiling is when a pattern is formed using DNA electrophoresis to compare individuals

d

* 1 mark blunt end drawn correctly
* 1 mark sticky end drawn correctly
* 1 mark for correct labelling for both

4a

* Sequence is cut out section of DNA/gene using restriction enzymes
* Same restriction enzymes are used to cut open a vector
* Section of DNA mixed with vector
* DNA ligase applied to seal the ends together
* Vector is added to a cell/ bacteria/ cell line
* Bacteria produces copies of the donor protein

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|  |

4a

* C

b

* So that DNA can denature/separate

c

* TAQ polymerase adds nucleotides to the growing DNA
* To continue the chain to replicate

d

* Does not denature at high temperatures