Mark schemes

Q1.

(a)   1.   Change in (sequence of) amino acid(s)/primary structure;
>   *Reject amino acids are formed.*
>   *Reject amino acids code.*

2.   Change in hydrogen/ionic/disulfide bonds;

3.   Alters tertiary/3^0 structure;
>   *Reject active site.*
>   *Ignore quaternary.*
>   *Ignore 3D.*

3

Q2.

(a)   Substitution;
>   *Accept inversion or translocation*
>   *Ignore 'point mutation'*

1

(b)

Max 2 marks for mark points 2, 3 and 4

1.   ($VO_{2\ max}$ **and** CS activity) increased for both groups;

2.   No statistical test, **so** do not know if **differences** are significant
OR
No statistical test, **so differences** could be due to chance;
>   *Ignore standard deviation*
>   *Accept correct named statistical test eg t-test*

3.   Only 8 weeks training
OR
Training did not last long;

4.   Might not be true for all types of training/exercise/females;

3 max

(c)   In Group **C**:

1.   Less mitochondrial replication/production;
>   *1. and 2. Accept converse for Group **T***

2.   Less transcription (of genes) for mitochondrial proteins/CS
OR
Less translation of (mRNA into) mitochondrial proteins;
>   *Accept less CS/enzyme is produced*

2

Q3.

(a)   1.   Replacement of a base by a different base (in DNA);

1

(d)   1.   Less NL3;

2.   More NR2A **and** NR2B;

2

(e)   1.   Higher ratio NR2B to NR2A with mutation;
Accept 'more' as equivalent to 'ratio'

2.   (Perhaps) better memory in mice with mutation;

2

[10]