Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) (Has) phosphate

OR

(Has) deoxyribose

OR

(Has) hydrogen bonds;

Ignore the number of hydrogen bonds
Accept both contain a pyrimidine/single ring (structure)
Accept 'H bonds'

1

(b) Correct answer of 8×10^{-6} **OR** 8.3×10^{-6}

= **2 marks**;;

Incorrect answer of

0.000 008 3 (correct answer but not in standard form) = **1 mark**

OR

8.3×10^{-8} (correct division using correct number of G-C pairs, and in standard form, but not shown as a percentage) = **1 mark**

OR

Correct answer in incorrect standard form; eg 83×10^{-7} = **1 mark**

OR

1.2×10^{9} (correct number of G-C pairs in the genome in standard form) = **1 mark;**

Accept any number of decimal places that round to 8.3

2

(c) 1. Substitution (mutation occurred):

2. (Only) one nucleotide/base pair is changed (in a gene)

OR

(Only) one (DNA) triplet/codon changed;

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3. Same amino acid (coded for);
   Reject same amino acid is produced
   Accept one amino acid changed

4. (Because) DNA/genetic code is degenerate;
   Accept a description of degenerate code
   can be awarded together, e.g 'different codons/ triplets code for the same amino acid' = MP3 and MP4

5. (So) tertiary structure is not changed;

6. (Change) could be in an intron;

7. Removed during splicing;

4 max

(d) 1. No (functional) enzyme/**X**;

2. (So) more/faster cell cycles;
   Ignore 'cell cycle isn't slowed down' on its own

3. More(frequent) DNA replication

   OR

   DNA replication not delayed;
   Accept 'faster DNA replication'

4. (So) mutations (more likely to) occur in DNA replication;

3 max

[10]

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Q2.

(a) 1. Chromatids do not separate;

*Accept 'chromosomes' for chromatids but reject **homologous** chromosomes.*

2. Non-disjunction;

2

(b) 1. Extra chromosome in gamete/egg/sperm/zygote

OR

All cells derived from a single cell/zygote;

Accept mutation for extra chromosome.

2. (Body cells) produced by mitosis;

2

(c) Cells with extra chromosome (are produced) from cells with mutation

OR

Cells with correct number (of chromosome are produced) from cells without mutation;

1

(d) Automarked question – Correlation coefficient;

(Box 1)

Answer key: A – Correlation coefficient

1

(e) 1. (More) blood moves from left to right ventricle (as left ventricle has thicker muscle);

2. Greater <u>volume</u> of blood to lungs

OR

(Higher blood pressure) in pulmonary artery;

2

[8]

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