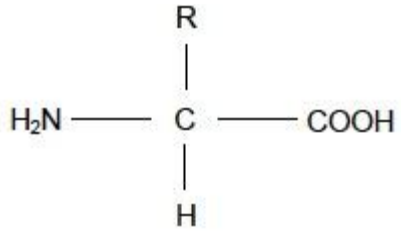
Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a)



Accept other correct representations.

1

(b) 1. More than one codon codes for a single amino acid;
Accept 'triplet' or 'sequence of 3 bases/nucleotides' for 'codon'.
Reject 'production/produces' for 'codes for'.
Do not infer mp1 from mp2.

2. Suitable example selected from Table 1;

2

(c) 1395;
Accept 1398 and 1401 (for those that include start and/or stop codons)
Allow 2796 or 2802 or 2790
Ignore 'bases/base pairs/bp/bps' written after the numerical answer.

1

(d) ✔CAA → CGA

1

(e) 1. (Both) negatively charged to positively charged change in amino acid;

2. Change at amino acid 300 does not change the shape of the <u>active site</u>
OR
Change at amino acid 300 does not change the tertiary structure OR Change at amino acid 300 results in a similar tertiary structure;
Reference to 'shape' of active site only needed once.

3. Amino acid 279 may have been involved in a (ionic, disulfide or hydrogen) bond **and** so the shape of the active site changes
OR
Amino acid 279 may have been involved in a (ionic, disulfide or hydrogen) bond **and** so the tertiary structure changed;
OR
Amino acid 279 may be in the active site **and** be required for binding the substrate;

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Reference to 'shape' of active site only needed once.
Both parts are required for each mark option.
For 'a bond' reject peptide bond.

3

[8]

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Q2.

(a) 1. Degenerate: more than one (base) triplet for each amino acid;

2. Non-overlapping: each base is part of only one triplet.

Accept codon (as would be applicable to mRNA code)

2

(b) A = adenine

C = cytosine

G = guanine

U = uracil

All four correct = 2
One error = 1
Two or more errors = 0

2 max

(c) AGT;

1

[5]

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Q3.

(a) 1. DNA of eukaryotic cell has non-coding regions / introns within gene

Allow converse: (But) a prokaryotic cell does not have non-coding regions / introns in DNA;

OR

pre-mRNA contains non-coding regions / introns;

2. (After transcription / during modification) these regions are removed from (pre-)mRNA;

Ignore references to 'cells need / bacteria do not need'

2

(b) 1. mRNA longer

OR

Has more nucleotides than tRNA;

2. mRNA is a straight molecule but tRNA is a folded molecule / clover-leaf shaped molecule;

3. mRNA contains no paired bases / hydrogen bonds but tRNA has some paired bases / hydrogen bonds.

2 max

[4]

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