

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Mark Schemes

Q1.

(a)

mRNA	tRNA
1. (Has) codon(s)	(Has) anticodon;
2. No hydrogen/H bonds/base pairs	Has hydrogen/H bonds/base pairs;
3. No amino acid binding site	Has amino acid binding site;
4. Linear/straight/not folded	'Clover (leaf' shape)/folded;
5. Long/many nucleotides/bases	Short/few nucleotides/bases;

*Must be comparisons**Accept description of binding site, eg amino acid only bound to tRNA**Accept mRNA cannot carry an amino acid, tRNA can***3 max**

(b) Phe, Arg, Ala;

*Reject if order is different***1**

(c) (Name of mutation)

1. (Single base) substitution;

(Change in DNA)

2. Guanine to thymine

OR

G to T

OR

GCC to TCC;

*Marks can be achieved in any section**Reject thiamine*

(Explanation)

3. (So) Arg (still) present

OR

No change in amino acid;

Reject amino acids are formed

4. (So) no change in primary structure

OR

(So) no change in tertiary structure

OR

(So) no change in active site (shape);

4

[8]

Q2.

- (a) 1. Variety **and** D **and** E in left column;
Accept if no table lines are shown, figures clearly written in rows and columns
Accept tables where mean is given in middle column and time is given in right column
*Accept type **OR** apple for variety*
Accept D and E in either order
2. Time **and** ' / min' **and** Mean (time) ' / min' in column heading only;
Accept mean values shown in rows rather than in columns
*Accept brackets **OR** "in" for solidus*
Ignore average for mean
*Accept min **OR** mins for minutes*
*Accept seconds **OR** secs **OR** sec for seconds*
Reject mixed units eg " / minutes and seconds"
3. Correctly calculated times **and** means calculated to one decimal place;
Accept correct times and correct means however presented

Examples achieving 3 marks

Variety	Time / minutes	Mean / minutes
D	15.8/15.83/16	16.1 OR 16.2 OR 16.3
	18	
	14.5/15	
E	6.5/7	7.2 OR 7.3
	8	
	7	

Apple	Time / s	Mean / s
D	950	
	1080	966.7
	870	
E	390	
	480	430.0
	420	

3

- (b) 1. More phenol/substrate in E
OR
 More PPO/enzyme in E

OR

Higher PPO/enzyme activity in E;

Ignore oxygen

2. (So) more enzyme-substrate/E-S complexes (form);
Accept the converse for D
Ignore ESC

2

- (c) 1. Use (enzyme's) higher/optimum temperature;
2. More kinetic energy

OR

(So) more active enzyme;

3. (Causing) increased rate of reaction

OR

(Causing) more enzyme-substrate complexes/collisions;

OR

4. Use (enzyme's) lower/optimum temperature

OR

Use (enzyme's) optimum pH;

1 and 4 Accept change in temperature

5. Less denaturation;

OR

(So) more active enzyme;

6. (Causing) increased rate of reaction

OR

(Causing) more enzyme-substrate complexes/collisions;

OR

7. Crush/grind/blend/chop the apple (tissue);
Accept cube for apple
Accept dice OR homogenise OR cut up OR slice for crush

8. (So) more PPO/phenol/substrate in contact with oxygen/air;

9. (Causing) increased rate of reaction

OR

(Causing) more enzyme-substrate complexes/collisions;

Mark in groups, 1, 2 and 3. OR 4, 5 and 6 OR 7, 8 and 9

3. 6. and 9. Accept ES complexes for enzyme-substrate complexes

3. 6. and 9. Accept a description of increased rate, eg 'speeds up reaction'

If oxygen is suggested, no mark for oxygen but MP8 and MP9 are available

3 max

- (d) Measure the intensity of brown colour by comparing apple tissue with a colour chart showing a range of apple tissues of known pigment concentration.

1

[9]