

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

Q1.

- (a) Cocaine (binding) changes shape of transporter/prevents dopamine binding;

Reject references to active site

Transporter cannot move (bound) dopamine (through membrane / protein / into cell);

Dopamine remains / builds up in synapses (leading to feelings of pleasure);

3

- (b) (i) Polymerase chain reaction / PCR;

1

- (ii) Single-stranded DNA;

Reject reference to a single strand of DNA

Bases / sequence complementary to DNA / gene to be identified;

(Radioactively / fluorescent) labelled so that it can be detected;

2 max

- (c) Mutation changes base sequence of gene / DNA;

Accept references to active site

(Thus) changing amino acid sequence;

Changes tertiary structure / shape of protein/transporter;

Cocaine binding site changes/cocaine cannot bind;

Dopamine can still bind (and be transported);

3 max

[9]

Q2.

- (a) 1. Replacement of a base by a different base (in DNA); 1
- (b) 1. (Depends on) size / mass (of protein);
2. (Depends on) charge (of protein);
Accept for 2 marks 'Smaller / more highly charged move further' 2 max
- (c) 1. Each protein has a different tertiary structure;
2. (Each) antibody has a specific antigen / binding / variable region / site;
3. So, (each antibody) forms different antigen-antibody complex
OR
(each antibody) only binds to complementary (protein); 3
- (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]