Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) 1. (Only) the presynaptic neurone/knob/membrane releases/has neurotransmitter/acetylcholine;

Accept abbreviations for acetylcholine e.g. ACh, Ach, AChol.

Ignore has/releases 'transmitter'.

2. (Only) the postsynaptic neurone/membrane has receptors
OR
No receptors in the presynaptic neurone/membrane;

2

(b) 1. Temporal

2. (Several/repeated impulses in short time) provide (enough) neurotransmitter/acetylcholine to reach threshold
OR
(Several/repeated impulses in short time) so (enough) sodium ions enter to reach threshold
OR
(Several/repeated impulses in short time) increases membrane potential to reach threshold;

Accept abbreviations for acetylcholine e.g. ACh, Ach, AChol.

Accept 'to cause depolarisation' or 'to produce action/generator potential' for 'to reach threshold'.

Accept Na^+ for sodium ions.

2

(c) 1. Less/no acetylcholine/neurotransmitter binds to receptor/s;

Accept abbreviations for acetylcholine e.g. ACh, Ach, AChol

Ignore competitive inhibition but reject 'active site'.

2. Less/no depolarisation
OR
Fewer/no action potential(s)
OR
Fewer/no sodium ions enter to reach threshold;

Accept 'takes longer for depolarisation or action/generator potential to be produced'.

Ignore 'weaker action potential/depolarisation'.

Accept Na^+ for sodium ions.

2

(d) 1. Less/no acetylcholine/neurotransmitter broken down;

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Accept (more) acetylcholine/neurotransmitter present/remains.

Accept acetylcholine/neurotransmitter remains attached to receptors (for longer) = 2 marks.

Accept ACh or other abbreviations e.g. AChol for acetylcholine.

2. (More) acetylcholine attaches to <u>receptors;</u>

Accept acetylcholine/neurotransmitter remains attached to receptors (for longer) = 2 marks.

Accept ACh or other abbreviations e.g. AChol for acetylcholine.

3. Depolarisation (of sarcolemma) occurs
OR
Action potential(s) produced
OR
(Enough) sodium <u>ions</u> enter to reach threshold
OR
Fewer/no antibodies attach;

Accept Na^+ for sodium ions.

3

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Q2.

(a) Correct answer of 8.1 / 8.07 / 8.066 / 8.0658 / 8.06575 × 10^{-3} = **2 marks**;;

Incorrect answer but shows 8 / 8.1 / 8.07 / 8.066 / 8.0658 / 8.06575 = **1 mark**

Correct answer but not in standard form = **1 mark**

Incorrect rounding of correct answer in correct standard form e.g. 8.06 × 10^{-3} = **1 mark**;

Note. *To award 2 marks × 10^{-3} is required.*
Accept 8 × 10^{-3} for 2 marks but 8.0 × 10^{-3} = 1 mark due to incorrect rounding.

2

(b) 1. For (valid) comparison as rats vary in mass
OR
(So) each rat receives a quantity relative to their mass
OR
(So) concentration in the blood/body is the same;
Accept 'standardisation' for 'comparison'.
Accept 'weight' for mass but ignore size.

1

(c) 1. SDs do not overlap (for blood glucose concentration)
OR
SDs do not overlap (for mass);

2. So significant difference/increase (in blood glucose concentration)
OR
So significant difference/increase (in mass);
Accept 'difference/increase is not due to chance' for significant difference/increase.
Ignore reference to stats test.

3. (Type II diabetes) causes high blood glucose (concentration);
Accept 'associated/linked/have' for causes.

4. Obesity/high body mass is a (risk) factor (in type II diabetes)
OR
High fat (diet) is a (risk) factor (in type II diabetes);

5. (Investigation) done on rats (not humans);

6. (Only shows) results after short-time period
OR
Long-term effects not known;
Accept 1, 2 or 3 weeks.

5 max

(d) 1. (Type II) still produce/release insulin;
*Accept 'type 1 would not produce/release insulin' **or** this would cause type I diabetes.*

2. (Type II) cells/receptors less/not responsive/sensitive to insulin;
Accept involves 'faulty receptors' or 'fewer receptors'.

3. Pancreatic cells not destroyed in (type II diabetes);

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Ignore pancreas is not destroyed.

4. Damage to pancreatic <u>cells</u> may affect processes/reactions (in the body);

2 max

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