

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

- (a) 1. To break actinomyosin (bridges);
Accept 'to form actinomyosin'.
Accept 'to detach or attach myosin and actin'.
Reject reference to 'active site'.
2. To move/bend the myosin head/arm;
Accept 'to change shape of myosin head/arm'.
Accept ADP/Pi moves (myosin) head/arm.
Accept powerstroke/pivot /recocks etc. for movement.
3. (So) actin (filaments) are moved (inwards);
Ignore 'sliding'.
4. For active transport of calcium ions (into the sarcoplasmic/endoplasmic reticulum);

2 max

(b) 1.35

OR

1.4;

Accept numbers after 1.35.

1

- (c) 1. Fast (skeletal muscle) fibres used during short-term/intense exercise;
1 and 2 Accept examples of short-term/intensity exercise e.g. sprint and longer-term/endurance exercise, e.g. marathon or low(er) intensity exercise.
Accept fast twitch fibres for fast (skeletal muscle) fibres
2. Slow (skeletal muscle) fibres used during long(er)-term exercise;
Accept slow twitch fibres for slow (skeletal muscle) fibres.
3. Creatine used to form phosphocreatine;
4. (Phosphocreatine) combines with ADP to form ATP;
5. (Carbohydrate/glucose) stored as glycogen

OR

Glycogenesis;

6. Glycogen hydrolysed to glucose

OR

Glycogenolysis;

7. Glucose for respiration;

Accept glycolysis for respiration.

Max 3 marks from mark points 3, 4, 5, 6 and 7.

5 max

- (d) 1. (More) glucose enters (muscle) cells;
Ignore more glucose leaves (liver) cells.
Reject glucose enters mitochondria.

2. (Glucose/fatty acids enter by) facilitated diffusion;
Accept active transport or cotransport.

3. Fatty acids used in Krebs cycle;
Ignore gluconeogenesis.

4. Respiration provides (more) ATP;
Accept in context of glucose or fatty acids.
Accept for fatty acids 'Krebs cycle produces ATP'.
Max 2 marks if only in context of glucose or only in context of fatty acids.

3 max

- (e) 1. Increase in CO₂ detected by chemoreceptors;
Accept increase in acidity/H⁺ or decrease in pH for increase in CO₂.
Ignore location of chemoreceptors.

2. Send (more) impulses to cardiac centre

OR

Send (more) impulses to the medulla;

2 and 3 Reject reference to 'an/one impulse' once only.

2 and 3 Reject 'signals', 'messages' for 'impulses' once only.

2 and 3 Accept 'action potentials' for impulses.

3. More impulses (from centre/medulla) along sympathetic pathway/neurones/nerves

OR

Fewer impulses (from centre/medulla) along parasympathetic/vagus pathway/neurones /nerves;

4. (To) SAN;

4

[15]

Q2.

- (a) 1. (There are) stretch-mediated sodium ion channels (in the membrane);
1, 2, 3, 4 Accept Na⁺
Max 2 if only reference to sodium and not sodium ions
2. (Increased pressure) deforms/changes (sensory neurone/axon) membrane/lamella(e)
- OR**
- (Increased pressure) deforms/changes sodium ion channels;
3. Sodium ion channels open;
4. Sodium ions diffuse in;
Accept sodium ions move in down a concentration gradient
5. Depolarisation (leading to generator potential);
Accept inside becomes positive

3 max

- (b) 1. An action potential is only generated/produced when threshold is reached

OR

An action potential is **not** generated/produced until/unless threshold is reached;

Ignore any numbers linked to threshold
1 and 2 Accept impulse for action potential

2. When high pressure was applied (to the fingertip), threshold was reached

OR

High pressure is (an) above threshold (stimulus)

OR

High pressure generates an action potential;
Accept references to 'the first peak' for high pressure
Accept the converse for low pressure

2

- (c) (The) refractory (period);
Ignore any reference to absolute or relative
Reject refraction period

1

[6]