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Annotated Short Answers

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Short answer questions

Briefly explain why Type 1 muscle fibres are better suited for aerobic/endurance type activities. You MUST use at least five different characteristics of Type 1 muscle fibres to justify your answer. (10 marks)

As this example illustrates, short answer questions require very specific answers, presented concisely and coherently.

The **introductory** (or **topic**) **sentence** provides a general overall answer to the question. See how the exact wording of the question has been used, perhaps to help the writer keep to the point as every word counts.

Type I muscle fibres are better suited for aerobic/endurance types of activities because they support oxygen and energy provision to the body better than **Type II muscle fibres**. The first advantage of **Type I muscle fibres** is their large **myoglobin** content, which is a protein in the muscles that binds to oxygen. Aerobic exercise requires oxygen and the **myoglobin** [to] carry the necessary oxygen. The second advantage is the large number of **capillaries**. These tiny **blood vessels** provide oxygen and nutrients from the blood that are needed while exercising. The third advantage is the large number of **mitochondria**, which produce the energy to continue exercising. **Because** of the higher **mitochondria** content, the fourth advantage is a high capability to produce ATP, one of the energy sources muscles **can** use during exercise. The fifth advantage is a high resistance to fatigue, which is necessary when exercising for longer periods of time. All these characteristics of **Type I muscle fibres** promote the required substances to the muscle in order to maintain activity for long periods of time.

Note the use of the repeated **transition signal** "The first [second, third...] advantage" at the beginning of each new characteristic to be discussed. Using this phrase helps connect one idea to another.

See how the writer has used the **present tense** throughout the response. This tense is used as it refers to generally accepted ideas and principles.

Note the skilful use of the **passive voice** "...oxygen and nutrients from the blood that are needed while exercising". The passive voice is used to take the focus off who did the action (the agent) and focus it on the happening described in the verb (the action). Written in the active voice, this sentence would say "...oxygen and nutrients from the blood that people need while exercising".

Here, a **strong link** has been made from one sentence to another by beginning the sentence with the **connector** "because".

Note the only use of a **modal verb** in this answer. The modal "can" is used here to slightly modify the meaning to express "possibility" and show that it is possible, but not necessary, for muscles to use ATP during exercise.

The **concluding sentence** sums up the argument presented in answer to the question. In this case, the writer focuses on the overall health benefits of Type 1 muscle fibres by beginning the sentence with the phrase "All these characteristics".

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This **introductory** (or **topic**) **sentence** provides an overall answer to the question. Note how the writer also provides some additional background information about Type 1 muscle fibres; e.g., They “comprise 50% of the total fibers present in skeletal muscle.”

Slow twitch, **Type I muscle** fibers comprise 50% of the total fibers present in skeletal muscle and are best suited for aerobic, endurance activities. **There are five major characteristics** attributable to **Type I muscle** fibers that make them better suited to such activities. **One such characteristic** is the high **ATP** production ability of these fibers. If **Type I** fibers can produce large amounts of ATP, they have sufficient

Note the use of **signposting** here where the writer signals that she will present **five** characteristics.

This writer uses a series of different **transition signals** to indicate that she is presenting a new point; e.g., “One such characteristic”, “Along the same lines”, “Likewise”.

energy to sustain their work over long periods of time. **Along the same lines**, **Type I muscle** fibers have high fatigue resistance, meaning they do not get tired as easily as **Type II** fibers. This sustains their ability to maintain work rates required by the body.

One way the writer achieves brevity is by using **reduced relative clauses**; e.g., “to maintain work rates **required** by the body”. If this clause was written in full, it would say, “...to maintain work rates **that are** required by the body.”

Note the use of American spelling for the word “fibers” throughout this response. Normally, British or New Zealand spelling conventions are followed at the University of Auckland. Whichever spelling convention is used, however, it is important to be consistent, as this writer is.

Likewise, a good oxygen supply is key to skeletal muscle’s ability to sustain workloads. Three factors that boost oxygen supply in Type I fibers are having a high number of **mitochondria**, many capillaries and large **myoglobin** content. Having a high number of **mitochondria** is beneficial as this is the site of aerobic **ATP** production, meaning **Type I** fibers will therefore have ample supply of ATP. **In addition to this**, having many **capillaries** provides an ample blood supply in which to transport vital oxygen and nutrients to exercising muscle. Having a large

See how the writer has used **signposting** to signal that she will present **three factors** that boost oxygen supply.

Note the skilful use of **specialised vocabulary**. Here, the writer has had to use differing plural forms of two words: ‘mitochondria’ is plural for ‘mitochondrion’ and ‘capillaries’ is plural for ‘capillary’.

The **concluding sentence** sums up the argument by linking back to the introductory sentence where she states that “Type 1 muscle fibers ... are best suited for aerobic, endurance activities”.

myoglobin content also increases oxygen supply to the exercising muscle. **Myoglobin** is an oxygen-binding protein of skeletal and heart muscle so having abundant amounts of this protein means that **Type I fibers** will have the necessary oxygen needed to respire **aerobically**.

Note the use of another **reduced relative clause** to keep the answer short “Type 1 fibers will have the necessary oxygen [that is] **needed** to respire aerobically”.

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Briefly answer the following question:

What is Type II diabetes and how is it different from Type I diabetes? (2 marks)

Answer A

Type II diabetes is a resistance to **insulin** that develops as a result of an excess of fat. **Because** the body resists **insulin**, glucose in the blood from ingested food is unable to cross the cell **membrane**. It [insulin] gathers in the blood, increasing blood glucose levels. **Type II diabetes** is an issue of insulin resistance, **but Type I** is a lack of insulin production. It is not caused by a lack of exercise or eating [an] excess amount of fat like **Type II** is, **but Type I diabetes** is an **auto-immune disorder**.

Answer B

Type II diabetes is a chronic disease that occurs in response to excess fat build up in cells, which leaves body cells *resistant to insulin*. Type II diabetes is characterized by a blood glucose level greater than 7 mmol L⁻¹, (after an 8 hour fast). In Type II diabetes, the pancreas still produces insulin[;] **however**, in Type I diabetes, the liver no longer produces any insulin at all (although body cells are still sensitive to it when it is injected).

As this example also shows, short answer questions require **brief and specific responses**. The number of marks allocated to a question gives an indication of the **expected length and depth** of the response.

In the **introductory** (or **topic**) **sentence** the writer begins to answer the first part of the question by stating what Type II diabetes is.

Note how the writer provides a strong **link** from the first to the second sentence by beginning the second with the **connector** "because".

In the two **concluding** sentences the writer answers the second part of the question and explains the difference between Type I and Type II diabetes.

Another way this writer **connects** her ideas is by using the **pronoun** "It". While using pronouns can be an effective means to connect one idea to another, check that the meaning is clear. Otherwise, repeat the noun or use a synonym or a noun phrase.

This writer also uses the **introductory sentence** to begin to answer the first part of the question. Note the writer's use of **italics** to emphasise a key point she is making.

See how the writer has used the **collocation** "chronic disease" to describe the nature of Type II diabetes. These two words frequently combine unlike alternatives such as "lasting disease" or "ongoing disease".

In the **concluding** sentence the writer answers the second part of the question by explaining the difference between Type I and II diabetes. The **connector** "however" is used to signal the transition to a discussion about something different: Type I diabetes.

Note the use of **brackets** in the final part of the question. Here the writer is providing additional information to clarify that she understands the body's reaction to insulin if it is injected.

Short answer questions from Sports Science

Requirements of short answer questions

Short answer questions require brief, concise, and specific answers that address each component of a given question. The number of marks allocated to a question gives an indication of the expected length and depth of a response.

Since marks are assigned to measure the ability to demonstrate a clear understanding of the topic addressed by a question, factual answers are required. Unlike essay writing, therefore, it is not necessary to use tentative language (e.g., "This perhaps indicates...") or to make strong claims (e.g., "This undoubtedly shows...").

Reference to the literature

Another difference of short answer questions to essay writing, is that no reference is made to the literature. Marks are allocated according to a student's ability to demonstrate his/her knowledge of the subject. In order for a student to produce a well-written answer, s/he would have clearly needed to refer to reputable literature.

Tense use

The present simple tense is used in answers to short answer questions as this refers to generally accepted ideas and principles; e.g., "There are five major characteristics attributable to Type I muscle fibers that make them better suited to such activities."

Modal verbs

Modal verbs are occasionally used to express, for example, ability or possibility: "If Type I fibers can produce large amounts of ATP, they have sufficient energy to sustain their work over long periods of time."

Active and passive voice

The active voice is most often used as this focuses on who did the action (the agent); e.g., "Aerobic exercise requires oxygen and the myoglobin [to] carry the necessary oxygen." Very occasionally the passive voice is used when the writer wishes to focus on the happening described in the verb (the action); e.g., "Type II diabetes is characterized by a blood glucose level greater than 7 mmol L⁻¹, (after an 8 hour fast)."

Reduced relative clauses

Reduced relative clauses are sometimes used to keep answers brief; e.g., "Type I fibers will have the necessary oxygen needed to respire aerobically." If this clause was written in full, it would include the words "that is"; i.e., "Type I fibers will have the necessary oxygen that is needed to respire aerobically."

Coherent and well-structured answers

An important feature of well-written answers to short answer questions is that they are coherent, and each idea is clearly linked to the one that precedes and follows it. Writers can create a coherent text by giving careful consideration to the overall structure of their answer and the logical connection of ideas within it. First, the answer needs to be well-structured. Questions that are worth more marks are likely to require longer answers. Such answers may, therefore, begin with an introductory sentence in which an overall answer to the question is given. The introduction is followed by the 'body' of the answer which contains the details of the argument. Then, the answer ends with a concluding sentence which sums up what has been discussed. Questions that are worth less marks are likely to require shorter answers. In these, the first sentence (or two) is likely to answer the first half of the question and the last sentence (or two), the latter part of the question.

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Using sentence connectors to make logical connections

In addition to considering the overall structure of the answer, the writer needs to consider the logical connection of ideas within it. A variety of strategies can be used to ensure a smooth flow of ideas. One is to use “signposting” where the writer gives an indication of what is to be discussed (e.g., “There are five major characteristics attributable to Type I muscle fibers that make them better suited to such activities. One such characteristic...”). Another method of achieving coherence is to use transition signals; e.g., In addition, furthermore, however. A further way is to use a pronoun (e.g., “Type II diabetes is an issue of insulin resistance, but Type I is a lack of insulin production. It is not caused by a lack of exercise or eating”). If you use pronouns, however, check that its meaning is clear. Otherwise, it is preferable to repeat the noun or use a synonym or a noun phrase (e.g., “The second advantage is the large number of capillaries. These tiny blood vessels...”).

Academic and specialised vocabulary

Another feature of well-written answers to short answer questions is that they use academic and specialised vocabulary. Using academic vocabulary means that there are no phrasal verbs (e.g., make up, think about), contractions (e.g., can't, haven't) or colloquial language (e.g., guys, things).

Drawing upon specialised vocabulary from the particular course is also a feature of short answer questions; (e.g., “The word pancreas is defined in the Oxford Advanced Learners' Dictionary as ‘an organ near the stomach that produces insulin and a liquid that helps the body to digest food’”). To use specialised vocabulary well, it is important to use the word's correct form (e.g., ‘mitochondria’ is the plural form of ‘mitochondrion’ and ‘capillaries’ the plural form of ‘capillary’) and use the word in an appropriate collocation; that is, with words that frequently combine together (e.g., ‘chronic disease’ NOT ‘continuing disease’ or ‘lasting disease’). Given the importance of correctly using specialised vocabulary, you may find it useful to build a glossary and focus on learning these words so that you are familiar with their meaning, the words they collocate with, and the various forms of the word.