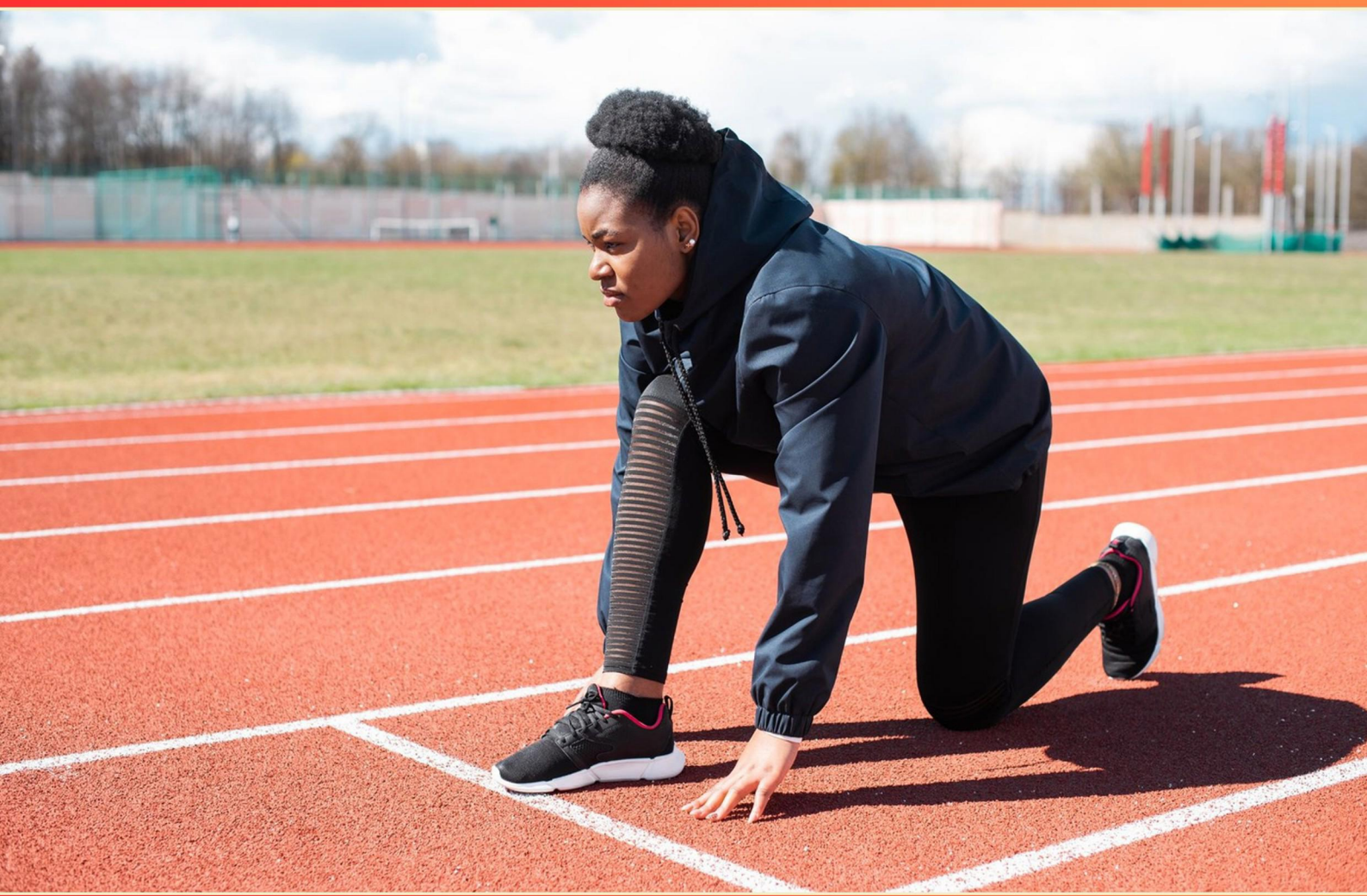
AQA A-LEVEL PE ENERGY SYSTEMS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

1. How many molecules of ATP are produced as a net yield per glucose during the short-term lactate anaerobic system (anaerobic glycolysis)?

A. 0

B. 4

C. 2

D. 36

2. Glycolysis yields a net of how many ATP per glucose?

A. Four

B. Three

C. Zero

D. Two

3. Stored fat is broken down into glycerol and free fatty acids for transport by the blood. What are the products?

A. Glycerol and free fatty acids

B. Amino acids

C. Glucose

D. Ketone bodies

4. How does gender affect VO2 max?

A. Men generally have approximately 20 percent higher VO2 max than women.

B. Women generally have approximately 20 percent higher VO2 max than men.

C. There is no gender difference in VO2 max.

D. Men have 50 percent higher VO2 max.

5. Which factor increases OBLA occurrence?

A. Higher exercise intensity increases OBLA occurrence.

B. RER near 1.0 increases OBLA.

C. Slow-twitch fiber predominance increases OBLA.

D. Faster lactate removal delays OBLA.

6. What is a common problem associated with altitude training, and what is a typical mitigation strategy?

A. Increased aerobic capacity; train at altitude.

B. Altitude sickness; live at altitude and train at sea level.

C. No changes in physiology; ignore acclimatization.

D. Increased bone density; move to lower altitude.

7. Which energy stores are listed as increasing VO2 max?

A. Increased stores of glycogen and triglycerides

B. Increased stores of amino acids

C. Increased stores of creatine phosphate

D. Reduced glycogen stores

8. Which enzyme is a key control point in glycolysis during high-intensity exercise?

A. Lactate dehydrogenase

B. Phosphofructokinase

C. Pyruvate dehydrogenase

D. Hexokinase

9. Which method measures the concentration of inspired oxygen and expired carbon dioxide to assess metabolic gas exchange?

A. Indirect calorimetry

B. Direct gas analysis

C. Cycle ergometer

D. Plyometrics

10. Which energy system provides the majority of ATP during submaximal, long duration exercise?

A. Glycolytic system

B. Aerobic system

C. ATP-PC system

D. Lactate shuttle

Answers

1. C
2. D
3. A
4. A
5. B
6. B
7. B
8. B
9. B
10. B

Explanations

1. How many molecules of ATP are produced as a net yield per glucose during the short-term lactate anaerobic system (anaerobic glycolysis)?

A. 0

B. 4

C. 2

D. 36

The key idea is that anaerobic glycolysis provides energy only through substrate-level phosphorylation in glycolysis itself, because there is no oxygen for oxidative phosphorylation. Glucose is broken down to lactate in the cytoplasm, and this pathway yields a net 2 ATP per glucose: four ATP are produced during glycolysis, but two are used in the early steps, so the net gain is two. The NADH produced is used to convert pyruvate to lactate, regenerating NAD+ to keep glycolysis going, but it does not generate additional ATP in the absence of oxygen. In contrast, the 36 ATP figure comes from full aerobic respiration, which isn't happening here. So the net ATP yield per glucose in the short-term lactate anaerobic system is two.

2. Glycolysis yields a net of how many ATP per glucose?

A. Four

B. Three

C. Zero

D. Two

Glycolysis shows energy accounting where you invest ATP upfront and then harvest more ATP later. For one glucose, two ATP are spent in the early steps to activate the sugar, and four ATP are produced later during the payoff phase (two ATP per split product). So the net ATP yield from glycolysis itself is 2 ATP per glucose. It also generates 2 NADH, which can contribute additional ATP later in respiration depending on cellular conditions, but the direct glycolysis net is two ATP. The numbers don't add up to four or zero, and they aren't three because of that initial energy investment.

3. Stored fat is broken down into glycerol and free fatty acids for transport by the blood. What are the products?

A. Glycerol and free fatty acids

B. Amino acids

C. Glucose

D. Ketone bodies

When stored fat is broken down, triglycerides in adipose tissue are cleaved into glycerol and free fatty acids. Glycerol is released into the bloodstream and travels to the liver where it can enter glycolysis or gluconeogenesis. The free fatty acids are carried in the blood bound to albumin and are delivered to tissues for beta-oxidation to produce acetyl-CoA and energy. Amino acids and glucose are produced from protein and carbohydrate metabolism, not directly from lipolysis, and ketone bodies are formed from acetyl-CoA mainly during prolonged fasting, not as immediate products of the fat-breaking process.

4. How does gender affect VO2 max?

A. Men generally have approximately 20 percent higher VO2 max than women.

B. Women generally have approximately 20 percent higher VO2 max than men.

C. There is no gender difference in VO2 max.

D. Men have 50 percent higher VO2 max.

VO2 max reflects how much oxygen the body can take up, transport, and use at maximal effort. Differences between men and women come from physiology that affects oxygen delivery: men typically have larger heart size and stroke volume, higher haemoglobin levels (more oxygen carried in the blood), and more muscle mass. These factors combine to give a higher maximal cardiac output and greater oxygen delivery in men, so their absolute VO2 max is about 20% higher on average. When VO2 max is adjusted for body weight, the gap is smaller and varies with training and body composition, but the common guideline is that men are around 20% higher in absolute terms. The other options don't fit typical physiology: there isn't a general situation where women surpass men, nor is the difference as large as 50%.

5. Which factor increases OBLA occurrence?

A. Higher exercise intensity increases OBLA occurrence.

B. RER near 1.0 increases OBLA.

C. Slow-twitch fiber predominance increases OBLA.

D. Faster lactate removal delays OBLA.

The key idea is that OBLA (the onset of blood lactate accumulation) happens when lactate production outpaces its removal. When the body relies mainly on carbohydrate metabolism, glycolysis runs at a high rate to supply quick energy. If mitochondria can't oxidize all the pyruvate fast enough, much of it is converted to lactate, and lactate builds up in the blood. A respiratory exchange ratio around 1.0 signals this high carbohydrate, glycolytic state, so lactate production is elevated and OBLA is more likely to occur earlier or at a lower work rate. Higher exercise intensity does push lactate up, but the specific driver here is the substrate use indicated by RER. Slow-twitch fibers are more oxidative and help clear lactate, so their predominance would delay OBLA. Faster lactate removal would also delay OBLA, not increase it.

6. What is a common problem associated with altitude training, and what is a typical mitigation strategy?

A. Increased aerobic capacity; train at altitude.

B. Altitude sickness; live at altitude and train at sea level.

C. No changes in physiology; ignore acclimatization.

D. Increased bone density; move to lower altitude.

Altitude exposure reduces the amount of oxygen available to the body, so a common problem is altitude sickness, with symptoms like headaches, nausea, fatigue, and sleep disturbance as the body tries to acclimate to hypoxia. The typical mitigation is to acclimatize and use a live-high, train-low approach: live at high altitude to trigger adaptations such as increased red blood cell production, but train at lower altitude to maintain training intensity and volume. This setup lets the athlete gain the oxygen-transport benefits of living high while preserving the quality of workouts by training where oxygen is more available. Other options don't fit because they either misstate the problem (expecting a straightforward aerobic capacity increase) or ignore acclimatization, and they don't reflect the practical strategy used to balance adaptation with training quality.

7. Which energy stores are listed as increasing VO2 max?

A. Increased stores of glycogen and triglycerides

B. Increased stores of amino acids

C. Increased stores of creatine phosphate

D. Reduced glycogen stores

The key idea is that VO2 max reflects how well the body can take in, transport, and use oxygen at maximal effort. It's driven by oxidative capacity—the ability of the cardiovascular system to deliver oxygen and the muscles to use it through mitochondria and oxidative enzymes. Increasing stores of amino acids fits with this because amino acids can be used as substrates for energy production during prolonged aerobic work and provide building blocks for enzymes involved in oxidative metabolism. Having more available amino acids supports the processes that raise the rate at which oxygen can be utilized during high-intensity effort, helping push VO2 max higher. In contrast, simply having more glycogen and triglyceride stores mainly extends how long you can fuel activity, not how fast your body can take up and use oxygen at peak effort. Creatine phosphate supports rapid, short bursts of power rather than sustained, maximal oxygen uptake. Reducing glycogen would likely decrease endurance and VO2 max possibilities. So, the option involving increased amino acid stores aligns best with supporting higher VO2 max by contributing to the substrates and enzymatic capacity used in aerobic metabolism.

8. Which enzyme is a key control point in glycolysis during high-intensity exercise?

A. Lactate dehydrogenase

B. Phosphofructokinase

C. Pyruvate dehydrogenase

D. Hexokinase

The movement of glucose through glycolysis under high-intensity exercise is governed by the enzyme that acts as the gatekeeper of the pathway. Phosphofructokinase catalyzes the committed, rate-limiting step—converting fructose-6-phosphate to fructose-1,6-bisphosphate. Its activity is highly sensitive to the cell's energy state: high ATP and citrate dampen it, while high AMP/ADP and inorganic phosphate activate it. During intense effort, ATP is rapidly consumed, raising AMP/ADP levels and lowering the energy charge, which strongly stimulates phosphofructokinase. This accelerates glycolysis to produce more pyruvate (or lactate under anaerobic conditions) to meet the urgent need for ATP. The other enzymes either act earlier in the pathway, help recycle NAD+ via lactate formation, or determine what pyruvate becomes (entering the mitochondria as acetyl-CoA), but they don't regulate the overall rate of glycolysis as directly as phosphofructokinase.

9. Which method measures the concentration of inspired oxygen and expired carbon dioxide to assess metabolic gas exchange?

A. Indirect calorimetry

B. Direct gas analysis

C. Cycle ergometer

D. Plyometrics

Indirect calorimetry analyzes metabolic gas exchange by measuring the concentrations of inspired oxygen and expired carbon dioxide to determine how much oxygen is consumed and how much carbon dioxide is produced. From these measurements you can calculate the respiratory quotient and energy expenditure, giving a clear picture of metabolic rate. This is typically done with a metabolic cart using a mask or hood to sample air as you breathe. The other options are exercise modes or a less directly relevant gas-measurement approach; they don't provide the streamlined readout of O2 uptake and CO2 production used to assess metabolic gas exchange.

10. Which energy system provides the majority of ATP during submaximal, long duration exercise?

A. Glycolytic system

B. Aerobic system

C. ATP-PC system

D. Lactate shuttle

In submaximal, long-duration exercise the body can sustain energy production primarily through aerobic metabolism. When the effort is steady and not maximal, oxygen supply to the muscles keeps pace with demand, allowing glucose and fatty acids to be oxidized in the mitochondria to generate ATP efficiently over time. This yields a large amount of ATP, which is ideal for endurance as it can continue for extended periods. The other options are associated with short, rapid bursts or different roles. The ATP-PC system provides immediate energy but only for a few seconds. The glycolytic system can produce ATP quickly but is limited by fatigue from lactate and hydrogen ion buildup, making it less dominant in long steady efforts. The lactate shuttle describes how lactate is transported between tissues for use as fuel, not a primary energy source for the majority of ATP during prolonged steady-state exercise.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://aqaalevelpeenergysystems.examzify.com

We wish you the very best on your exam journey. You've got this!