

Managing short answer exams

Writing short answer questions in the Sciences

Students often do not score well on short answer questions because they engage in a 'brain dump' of information rather than a careful analysis of the question. Consequently, they do not always provide the information that the examiner was looking for.

To do well in an exam it is important to understand fully what the question is asking and how it should be answered before you start writing.

Read the question very carefully

What are you being asked about? What content or knowledge are you being asked to express? What part of the course does it relate to?

How are you being asked to present your knowledge (explain? analyse? compare?)

Where are the limitations? Many questions also have restrictions (limiters) that ask you to focus the answer on some specific element of the information.

For example:

Outline the diversity and classification of marine mammals found in Australian waters.

In this question the limiting terms restrict the main topic to 'diversity and classification' and 'Australian waters'. Therefore, the answer should outline the diversity and classification of marine mammals, referring **only** to those found locally in Australian waters. No marks will be given for including species found elsewhere, or for referring to the diversity and classification of non-marine mammals etc.

Write a sufficient amount

How many marks is the question worth? The relative weighting of the question can help you to gauge how much you need to write. For example, a four-mark question may require you to elaborate on two points. A 10-mark question will require considerably more elaboration and may require you to cover five points. (See Sample answer 2 on the next page.)

You will have less time and space for short answers which should be concise. The use of the terms *describe*, *discuss* or *explain* can alert you that the examiner wants some detail, in full sentences, whereas *list* or *outline* generally allows for less information, simply presented.

The most important goal is to focus on the key aspects of the question and to convey the answer clearly. Sometimes logically organised dot points can achieve this goal as effectively as a well-constructed paragraph.

However, your ideas need to be organised in a logical manner and cause and effect relationships should be made obvious. Do not expect your examiner to make these connections for you or to read through a lot of irrelevant information to work out what you mean.

Use appropriate terminology

Use technical or scientific terms from your course to demonstrate your understanding and knowledge in the area. Technical terms are highly specific and thus reduce the total number of words that you will need to write. Support the key points in your answer with evidence such as well chosen examples from your course.

In the following example, excerpt **1** uses scientific terminology. It is clearly a more appropriate answer than excerpt **2** which is not clear and does not demonstrate sufficient understanding of the fermentation process.

1. Yeast are **facultatively anaerobic** which means that they perform fermentation only under **anaerobic conditions**. In the presence of O₂, the yeast will perform **aerobic metabolism**.

2. Yeast can choose between using oxygen and not using oxygen. They will ferment stuff only when there is not enough oxygen around.

Adapted from:

<http://www.uwlax.edu/biology/communication/answeringsayquestions.htm>

Diagrams can be a useful aid to explanation. However a diagram must be clear, well labelled and accompanied by some explanation so that your examiner knows *how* it relates to the question.

Starting your response by repeating some of the key words question can help you stay on track. For example, an exam question related to animal reproduction (on the next page) has two separate aspects which could be referred to in your opening statement:

- 1. Asexual reproduction can be defined as ...*
- 2. The advantages of asexual reproduction are ...*

Sample Biology question

Consider asexual reproduction and sexual reproduction in animals.

Define asexual reproduction and sexual reproduction, and give two examples of each.

What are the advantages and disadvantages of asexual reproduction and sexual reproduction?

(10 marks)

Sample answer 1

Asexual reproduction occurs only by self-fertilisation. This produces offspring with no genetic variation.

Sexual reproduction occurs when separate male and female gamete from the same species unite to produce offspring.

Asexual reproduction has several advantages:

- reproduction can occur without a mate
- it is usually faster

However, there is no genetic variation.

Sexual reproduction has the advantage of producing genetically varied offspring.

However, both a male and female from the same species are needed for this to occur.

Score: This response scored a total of 4/10.

Comments: The definition of asexual reproduction is incorrect (zero out of two), while definition of sexual reproduction correct, but not enough detail given (one mark out of two). No examples given for either form of reproduction (zero out of two). One disadvantage for asexual is mentioned (1 mark). Advantages of asexual are correct and one advantage of sexual is mentioned (1 mark) (three marks out of four).

Sample answer 2

Asexual reproduction is the formation of offspring entirely from one parent. Cell division is via mitosis. Sexual reproduction, however, requires two different individuals (parents) that each produce gametes via the process of meiosis.

Each haploid gamete (sperm for males and egg for females) needs to fuse with the opposite gamete (from another individual) to form a diploid zygote. This becomes a new individual, containing genetic information from both parents.

Examples:

Asexual	Sexual
Planaria	fertilisation in mammals
Parthenogenesis	fertilisation in earthworms

(Sample answer 2 continued)

Sexual reproduction produces a huge variation in offspring. Variation is the key to survival in an ever-changing environment, however, sexual reproduction requires finding a partner and this may not always be easy (self-fertilization in plants overcomes this problem).

Asexual reproduction does not require a mate, and so in this sense it can be desirable. However, no genetic variation can be costly in an ever-changing environment.

Score: This answer received 10/10.

Comments: The response received a maximum score because:

- it defined asexual reproduction (the offspring comes directly from one parent, via mitosis): 2 marks
- it defined sexual reproduction (requires two different parents - fusion of the haploid gametes of each - which are formed via meiosis): 2 marks
- it provided two examples of each type of reproduction $\frac{1}{2}$ a mark per example = 2 marks in total
- it explained the advantages and disadvantages of each type of reproduction (sexual reproduction produces genetically varied offspring, however it requires that a partner be found): 2 marks, and
- noted that asexual reproduction doesn't require a partner, however, it also doesn't provide any genetic variation between generations: 2 marks.

The second sample answer is clearly a complete, well-organised, logically sequenced response which uses the language of the discipline appropriately.

Works cited

Samples from University of Melbourne. *AIRport*. Retrieved 29 July 2011, from <https://airport.unimelb.edu.au/science/>

Further resources

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