Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Biology (1BI0) Higher

Resource Set Topic 4: Natural selection and GM

Questions

(Public release version)

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Additional Assessment Materials, Summer 2021

General guidance to Additional Assessment Materials for use in 2021

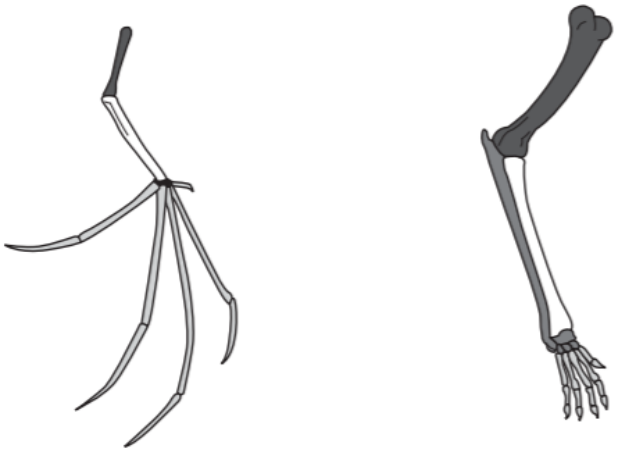
Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

7 (a) Figure 13 shows the pentadactyl limb of a bat and a cat.



bat cat

Figure 13

(i) Describe the reasons why the anatomy of the pentadactyl limb suggests that bats and cats evolved from a common ancestor.

(2)

(ii) Genetic analysis also provides evidence for evolution.

Scientists can sequence genes from different organisms.

Describe how this type of genetic analysis provides evidence for evolution.

(2)

9 (a) Yeast cells can be genetically modified to produce a painkiller.

This painkiller is usually obtained from opium poppies.

One method for genetically modifying a yeast cell uses a plasmid containing the desired gene.

(i) Explain how a gene can be inserted into a plasmid.

(2)

(ii) Discuss the possible benefits and risks of producing painkillers from genetically modified yeast cells rather than extracting the painkillers from poppies.

(3)

(b) Colistin is an antibiotic used to treat infections in the bloodstream.

Some bacteria are resistant to Colistin.

Explain how these bacteria have become resistant to Colistin.

(4)

5 (a) Organisms can be classified by the five kingdom or three domain method.

(i) What is the name of the domain that plants belong to?

(1)

☒ **A** Eukarya

☒ **B** Archaea

☒ **C** Monera

☒ **D** Protista

(ii) Plant cells contain chloroplasts.

What happens in a chloroplast?

(1)

☒	**A**	oxygen produced	sunlight absorbed by chlorophyll
☒	**B**	carbon dioxide produced	sunlight absorbed by mitochondria
☒	**C**	oxygen produced	sunlight absorbed by mitochondria
☒	**D**	carbon dioxide produced	sunlight absorbed by chlorophyll

(iii) Give a reason why the three domain method of classification has been suggested.

(1)

(c) Figure 8 shows a plasmid containing the human insulin gene.

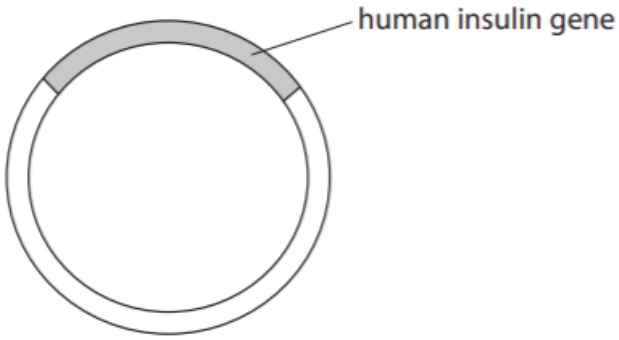


Figure 8

Explain how the human insulin gene can be inserted into a plasmid.

(3)

(b) Scientists think that great tits living now have longer beaks because of the increased use of bird feeders during the last 50 years.

Explain how natural selection could have caused an increase in beak length because of the use of bird feeders.

(4)

5c

(c) Birds are classified in the domain Eukarya.

(i) Why are the cells from birds described as eukaryotic?

(1)

- ☒ **A** they have membrane-bound organelles
- ☒ **B** they do not have nuclei
- ☒ **C** they have a rigid cell wall
- ☒ **D** they have a cell membrane

(ii) Give **one** reason why the three domain classification system was proposed.

(1)

7bi-ii

(b) Some bacteria contain a gene that produces a toxin that can kill insects.

This gene can be inserted into the genome of a crop plant.

(i) What method is used to insert the gene from the bacteria into the crop plant?

(1)

☒ **A** selective breeding

☒ **B** asexual reproduction

☒ **C** genetic engineering

☒ **D** tissue culture

*(ii) Discuss the advantages and disadvantages of growing crop plants that produce a toxin that can kill insects.

(6)

TOTAL = 33 MARKS