Practice Question Set For GCSE
Subject : Biology
Paper-1 Topic: B4 Bioenergetics

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Mark Schemes

Q1.

(a) vectors are used to insert genes into cells

1

vectors are usually plasmids or viruses

1

(b) wheat not affected by spraying / herbicide

allow only weeds affected / killed by spraying / herbicide

1

(so) wheat gets more light / water / nitrates / ions / minerals

allow less competition for light / water / nitrates / ions / minerals
ignore nutrients
ignore carbon dioxide
ignore space

1

(so) more photosynthesis / glucose / proteins (for more yield)

1

idea of more needed at least once for mp 2 and 3

(c) any **two** from:

- production of human insulin / medicines
- crops resistant to diseases / pests

allow examples such as potatoes resistant to blight

- crops resistant to frost
- crops resistant to drought
- crops / foods with added nutrients

allow examples such as golden rice with vitamin A gene

- plants / crops with more / bigger fruits **or** higher yield

allow examples such as larger tomatoes

- crops with improved taste
- crops with improved shelf life

2

(d) identify genes linked to (certain) disease

allow correctly named diseases such as cancer / diabetes

1

so can lead to better prevention / treatment of that disease

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or

identify genes causing inherited disorders (1)

so may prevent children being born with the disorder by using IVF **or** gene therapy (1)

or

tracing human migration patterns from the past **or** evolution of humans (1)

so to better understand the ancient history of humans (1)

1

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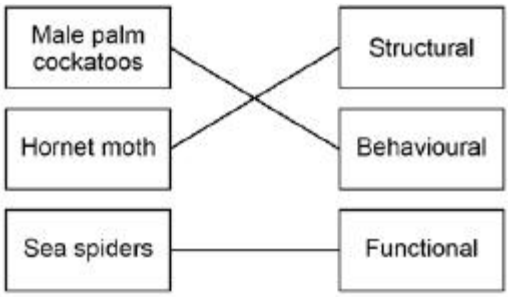
Q2.

(a)



*all correct for **2** marks*
*allow **1** mark for one or two correct line(s)*
additional lines from a box on the left negates the mark for that box

2

(b) any **four** from:

- growing on other plants means support to absorb more light (for photosynthesis)
  allow to obtain water / minerals / ions / glucose from the other plant
  ignore nutrients

- bright colours attract pollinators

or

bright colours attract insects to transfer pollen
  allow fertilisation for transfer of pollen

- large quantities of pollen (increases the likelihood of pollen transfer) and so more seeds / reproduction

- tiny / light seeds will travel long distances to grow in new areas
  allow tiny / light seeds will travel away from competitors

- many seeds mean many new plants so will out-compete other species
  allow many seeds so more (orchids) will survive

4

(c) any **four** from:

- mutations for purple flower (in ancestral species)
  allow genetic variation gives purple flowers

- isolation **or** change in environment e.g. area had more insects
  allow purple orchid more suited to a new environment

- (plants with purple flowers) survive and breed

- (plants with purple flowers) pass on allele / gene / DNA / mutation
  allow genetic material for allele

- until they were so different they could no longer interbreed (with the ancestral species)
  allow breed successfully for interbreed

4

(d) species **D**
  must be an attempt at an explanation to gain this mark

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1

because it has the lowest number of amino acids different (in the sequence)

allow because it has the highest number of amino acids which are the same (in the sequence)

1

or

because it has the lowest number of differences in the sequence

allow because it has only one difference in the sequence

or

only one / sixth amino acid is different

allow only the glycine / gly has been changed to tyrosine / tyr

[12]

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