



EXAM PAPERS PRACTICE

Boost your performance and confidence with these topic-based exam questions

Practice questions created by actual examiners and assessment experts

Detailed mark scheme

Suitable for all boards

Designed to test your ability and thoroughly prepare you

Level: IGCSE Oxford AQA Biology (9201)

Subject: Biology

Topic: IGCSE AQA Biology

Type: Mark Schemes

2002



1583

To be used by all students preparing for IGCSE Oxford AQA Biology (9201)
Students of other Boards may also find this useful

Biology

IGCSE AQA

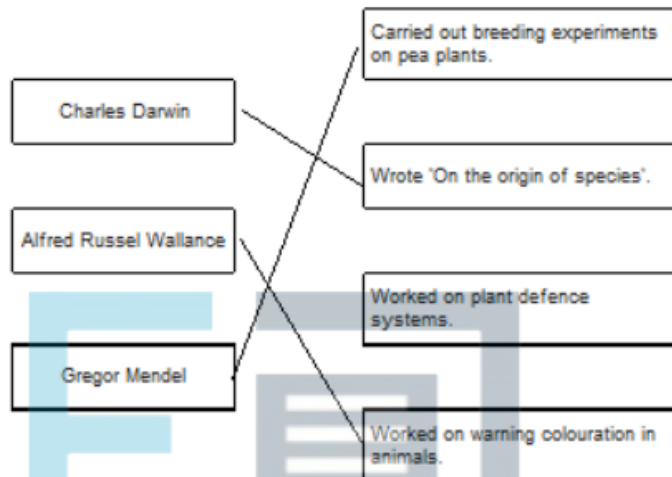
Key skills



Mark schemes

1.

(a)



(b) a gene

allow allele

(c) 4

(d) correct derivation of children's genotypes

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identification of children with cystic fibrosis (dd)

0.25

allow ecf

allow 1/4 / 25% / 1 in 4 / 1:3

do not accept 1:4

(e) heterozygous

3

1

1

1

1

1

1

1

[9]



2.

- (a) any **two** from:
- larger / longer / thicker
allow examples eg fewer toes or bones fused
 - fewer (bones in total)
allow smaller surface area touching the ground
 - fewer bones touching the ground

2

(b) (i) large(r) surface / area in contact with the ground

or

low / less pressure on ground

(so) less likely to sink into mud / ground

or

(so) could run fast(er)

allow easy / easier to escape predators

1

1

(ii) variation (in size / number / arrangement of bones)

allow mutation(s) (in size / number / arrangement of bones)

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1

(and) those with large(r) / few(er) bones more suited to running **or** run faster (on harder / drier ground)

1

these survive **and** breed

allow ref to offspring for breed

1

(so) genes / DNA (for larger / fewer bones) passed on

allow alleles passed on

1

[8]



3.

(a) reference to interbreeding

1

successfully between Island types

allow ref. to production of fertile offspring

allow ref. to DNA analysis / comparison for 1 mark

ignore ref. to grey fox

1

(b) (i) (two ancestral populations) separated / isolated (by geographical barrier / sea)

1

and genetic variation (in each population) **or** different / new alleles **or** mutations occur

1

under different environment / conditions

allow abiotic or biotic example

allow different selection pressures

natural selection occurs **or** better adapted survived to reproduce

1

so (favourable) alleles / genes / mutations passed on (in each population)

1

ignore they adapt to their environment

1

(ii) any one from:

• continued to mate with one another

• few beneficial mutations (between island varieties)

• similar conditions on each island so similar adaptations/features fit

1

[8]



4.

(a) (i) nucleus

correct spelling only

accept mitochondrion

ignore genes / genetic material / chromosomes

1

(ii) base(s)

Accept all four correct names of bases

ignore nucleotides and refs to organic / N-containing

1

(iii) 4

1

(iv) codes for sequence / order of amino acids

ignore references to characteristics

1

codes for a (specific) protein / enzyme

or

the sequence / order of three bases / compounds / letters

codes for a specific amino acid

or

the sequence / order of 3 bases / compounds / letters

codes for the order / sequence of amino acids

1

(b) (i) DNA

1

circular / a ring **or** a vector / described

1

(ii) kills any cells not having **kan^r** gene / so only cells with **kan^r** gene survive

1

hence surviving cells will also contain **Bt** gene / plasmid

1



(iii) cells divide by mitosis

ignore ref to asexual reproduction

correct spelling only

1

genetic information is copied / each cell receives a copy of (all) the gene(s) / all

cells produced are genetically identical / form a clone

1

(iv) any **two** from:

- gene may be passed to pathogenic bacteria
- cannot then kill these pathogens with kanamycin
- **or**
- cannot treat disease with kanamycin
- may need to develop new antibiotics
- gene may get into other organisms
- outcome unpredictable

2

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5.

(a) sexual

1

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characteristic

1

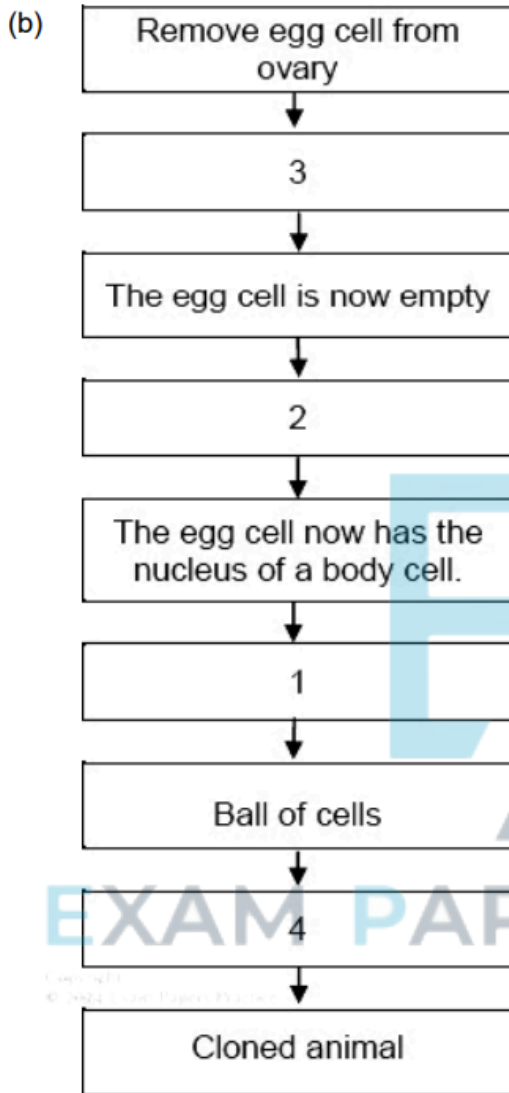
mutation

1

chromosome

this order only

1



four correct gains 3 marks
two or three correct gains 2 marks
one correct gains 1 mark
accept correct connection between statement and box

3

[7]

- 6.** (a) (i) 3.15 : 1
accept 3.147:1 or 3.1 : 1 or 3 : 1
do not accept 3.14 : 1
ignore 705:224

1



(ii) any **two** from:

- fertilisation is random **or** ref. to chance combinations (of alleles / genes / chromosomes)
- more likely to get theoretical ratios **or** see (correct) pattern **or** get valid results if large number
allow ref. to more representative / reliable
*do **not** allow more accurate **or** precise*
ignore fair / repeatable
- anomalies have limited effect / anomalies can be identified
accept example of an anomaly

2

(b) (i) in sequence:

Homozygous
Homozygous
Heterozygous

All 3 correct = 2 marks

2 correct = 1 mark

1 or 0 correct = 0 marks

2

(ii) genetic diagram including:

Parental genotypes: **Nn** and **Nn**

allow other characters / symbols only if clearly defined

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1

or

Gametes: **N** and **n** + **N** and **n** derivation of offspring genotypes: **NN** **Nn** **Nn**
nn

allow genotypes correctly derived from candidate's P gametes

1

identification: **NN** and **Nn** as purple **and** **nn** as white

allow correct identification of candidate's offspring genotypes but only if some F₂ are purple and some are white

1



(c) any **two** from:

- did not know about chromosomes / genes / DNA
or did not know chromosomes occurred in pairs
ignore genetics
- had pre-conceived theories
eg blending of inherited characters
ignore religious ideas unless qualified
- Mendel's (mathematical) approach was novel concept
allow his work was not understood or no other scientist had similar ideas
- Mendel was not part of academic establishment
allow he was not considered to be a scientist / not well known / he was only a monk
- work published in obscure journal / work lost for many years
- peas gave unusual results of other species
allow he only worked on pea plants
- Mendel's results were not corroborated until later / 1900

2

[10]