



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) large number – more representative and so more valid (mean can be calculated)
allow more reliable 1
- random – avoid bias 1
- (b) correct figures in table:
(3)
(8)
(16)
19
9
4
1 1
- (c) all bars plotted correctly
 $\pm 1 \text{ mm}$
allow ecf from the table 1
- (d) any **three** from:
• much overlap of values between the 2 shores
sheltered shore:
accept converse for exposed shore
- wider range **or** use of figures – e.g. approx 0.26 to 0.70 cf 0.21 to 0.55
 - higher mode **or** use of figures – e.g. 0.41 to 0.45 cf 0.36 to 0.40
allow ecf for figures from (b)
 - there are no limpets at 0.21 to 0.25
allow there are no limpets on exposed shore at 0.56 to 0.70



(e) sheltered – 0.47 **or** 0.466

1

exposed – 0.35 **or** 0.354

1

(f) radius = 2.48 cm

an answer of 38.6 / 38.62 / 38.64 scores 3 marks

1

(area = $3.14 \times (2.48)^2 =$) 19.3 cm²

allow area calculated from incorrect radius

1

(force = $19.3 \times 2 =$) 38.6 (newtons)

or

(force = $[3.14 \times (2.48)^2] \times 2$)

= 38.62 (newtons)

or

(force = $[\pi \times (2.48)^2] \times 2$)

= 38.64 (newtons)

allow force calculated from 1 previous error

1

(g) any **two** from:

- foot may not be circular
- foot may be larger / smaller than outside of shell
- scientists' value is approximate
- variation between limpets / described

*e.g. re muscle development **or** greater 'awareness' of some limpets*

- variation in rock surface texture

2

(h) any **three** from:

- more force of waves to dislodge limpets
- lower height lowers exposure to waves
- wider foot gives greater grip
- those with this / these feature(s) pass on alleles / genes to offspring leading to population of broad squat limpets

allow converse for sheltered shore throughout, if clearly stated

3

[17]



2.	(a) there is an uneven distribution of dandelions or (more) representative / valid or avoid bias or more accurate / precise mean <i>ignore accurate / precise unqualified</i> <i>ignore repeatability / reproducibility / reliability / fair test</i>	1
	(b) (correct mean per m ² =) 6 or 6.0	1
	(correct field area =) 55 000 (m ²)	1
	mean × area – e.g. 6(.0) × 55 000 <i>allow incorrect calculated values for mean and / or field area</i>	1
	330 000 <i>allow correct calculation from previous calculation</i>	1
	3.3×10^5 <i>allow calculated value in standard form</i>	1
	<i>an answer of 3.3×10^5 scores 5 marks</i> <i>an answer of 330 000 scores 4 marks</i>	
	(c) Level 3: The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5–6
	Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.	3–4
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2



No relevant content

0

Indicative content

- placing of quadrat
- large number of quadrats used
- how randomness achieved – e.g. table of random numbers **or** random number button on calculator **or** along transect
- quadrats placed at coordinates **or** regular intervals along transect
- in each of two areas of different light intensities **or** transect running through areas of different light intensity
- for each quadrat count number of dandelions
- for each quadrat measure light intensity
- compare data from different light intensity

to access **level 3** the key ideas of using a large number of quadrats randomly, or along a transect, and counting the number of dandelions in areas of differing light intensity need to be given to produce a valid outcome

(d) any **two** from:

- temperature

allow heat

- water

allow moisture / rain

- (soil) pH

allow acidity

- minerals / ions

*allow e.g. magnesium ions **or** nitrate*

allow salts / nutrients

- winds

- herbivores

allow trampling

ignore carbon dioxide

ignore space

ignore competition unqualified

*do **not** accept oxygen*

2

[14]



3.

(a) (i) counts / 12

1

$\times 120 \times 80 / \times 9600$

or

\times area of field

1

(ii) (more) quadrats / repeats

1

placed randomly

ignore method of achieving randomness

1

(b) (i) any **three** from:

- temperature / warmth / heat
- water / rain
- minerals / ions / salts (in soil)
allow nutrients / fertiliser / soil fertility

ignore food

- pH (of soil)
- trampling
- herbivores

ignore predators

- competition (with other species)
- pollution qualified e.g. SO_2 / herbicide
- wind (related to seed dispersal).

ignore space / oxygen / CO_2 / soil unqualified



(ii) light needed for photosynthesis

1

for making food / sugar / etc.

1

effect on buttercup distribution eg more plants in sunny areas / fewer plants in shady areas

1

(c) (i) fertiliser / ions / salts cause growth of algae / plants

1

(algae / plants) block light

1

(low light) causes algae / plants to die

1

microorganisms / bacteria feed on / break down / cause decay of organic matter / of dead plants

do not allow germs / viruses

1

(aerobic) respiration (by microbes) uses O₂

do not allow anaerobic

1

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(ii) sewage / toxic chemicals / correct named example eg metals / bleach / disinfectant / detergent etc

allow suitable named examples eg metals such as Pb / Zn / Cr / oil / SO₂ / acid rain / pesticides / litter

ignore chemicals unqualified

ignore waste unqualified

ignore human waste / domestic waste / industrial waste unqualified

1

- (d) (i) 2 1
- (ii) more food
allow other sensible suggestion eg more species colonise from
tributary streams after forest 1
- (iii) number of stonefly species decreases (from A to B / B to C / A to C) as more
pollution enters river / less oxygen
allow fewer species in more polluted water
ignore none are found at site C 1

[19]