

Classification

Mark Scheme 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Biodiversity, classification and conservation
Sub Topic	Classification
Booklet	Theory
Paper Type	Mark Scheme 2

Time Allowed : 74 minutes

Score : / 61

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

- 1 (a) 1. anthers, outside flower / exposed, to allow wind to carry pollen away ;
2. long / flexible, filaments to allow wind to dislodge pollen ; **A** versatile anthers
3. no / small, petals to allow, anthers/ pollen, to be exposed to the wind ;
4. anthers large to produce large quantities of pollen ; [2 max]
- (b) 1. (genetic) mutation / random changes (in corn borer) ;
2. caterpillars / corn borers, with mutation, more likely to survive / have selective advantage ;
3. (adults with this mutation) likely to breed ;
4. mutated gene / resistance alleles, passed on to next generation ;
5. increase in frequency of allele for resistance ; [3 max]
- (c) rr ; [1]
- (d) 1. when (non resistant) borers from outside breed with resistant borers, many offspring will not be resistant ;
2. because (many) offspring will be, Rr / heterozygous ;
3. detail, e.g. results of rr x RR **and** rr x Rr ; [2 max]
- (e) (i) 1. much mixing ;
2. more marked females recaptured than marked males, showing more mixing of males ; **ora**
3. high percentage of recaptured borers were unmarked ;
4. unmarked borers come from different fields ;
5. ref. considerable variation between results for different trials ;
6. use of data from shaded columns ; [3 max]
- (ii) 1. (HBR strategy needs) mating between borers from *Bt* fields with borers from outside ;
2. (results show) marked females had mated with marked males / only some marked females had mated with unmarked males ;
3. use of figures relating to above point ;
4. (this means that) many females mated with males from the same field ;
5. (so) many females from a *Bt* field would mate with males from *Bt* field;

6. their offspring would all be, resistant / rr ;
7. ref. this reduces the effectiveness of the HDR strategy / fewer heterozygotes ;
[4 max]

[Total: 15]



- 2 (a) 1 bacterium obtains energy ;
2 for synthesis of materials ;
3 for, growth / division ;
4 does not need to use carbon compounds for energy ; **A** named carbon compound [2 max]

- (b) 1 takes up large area ;
2 unsightly ;
3 requires, lot of water / continuous water supply ;
4 contamination of water / pollution due to acid ;
5 Cu / Fe, toxic to plants ; [2 max]

- (c) *bioleaching (accept ora for mining)*
1 low level technology / no sophisticated machinery / requires less maintenance ;
2 low energy consumption / less fossil fuels used ;
3 few safety hazards / safer ; **R** no hazards
4 organism easy to, obtain / culture ;
5 self replicating ;
6 waste less hazardous ;
7 disposal of waste, costs less / is easier ;
8 ref. low grade ores / scrap iron ;
9 less workers needed ;
10 ref. use in situ ; [4 max]

[Total:8]

CHEMISTRY ONLINE
— TUITION —

- 3 (a)
1. multicellular ;
 2. (cells are) differentiated into tissue ;
 3. autotrophic / photosynthetic ;
 4. eukaryotic (cell ;
 5. starch is storage compound ;
 6. (some have) chloroplasts / chlorophyll ;
 7. cell wall ;
 8. made of cellulose ;
 9. plasmodesmata ;
 10. large (central) vacuole ;

[max 7]

- (b)
1. 0.5–1.0 μm , diameter / width ;
 2. double membrane ;
 3. inner membrane folded / cristae ;
 4. hold, stalked particles / ATP synthase / ATP synthetase ;
 5. site of ET ;
 6. ref. H^+ and intermembrane space ;
 7. ATP production ;
 8. oxidative phosphorylation / chemiosmosis ;
 9. matrix is site of, link reaction / Krebs cycle ;
 10. enzymes in matrix ;
 11. 70S ribosomes ;
 12. (mitochondrial) DNA ;

[max 8]

[Total: 15]

- 4 (a) *corals*
1. (cells) have no chloroplasts ;
 2. (cells) have no, cell walls / large vacuoles ;
 3. are heterotrophic / not autotrophic / not photosynthetic ;
- [2 max]
- (b) biotic and abiotic components **or** living and non-living components ;
correct ref. to interaction ;
- [2]
- (c) (i) Indian Ocean = 22(%)
Pacific Ocean = 9(%) ;
both correct for 1 mark
- [1]
- (ii) any three from
1. named marine pollutant ; e.g. oil / sewage
 2. example of climate change ; e.g. sea level rising /
change in sea temperature / decrease in oxygen concentration of sea
 3. (increasing carbon dioxide) decrease in pH of sea ;
 4. intensive fishing ;
 5. tourism qualified ;
 6. removal of parts of reef ;
 7. reclaiming land ;
- [3 max]

[Total: 8]

CHEMISTRY ONLINE
— TUITION —

- 5 (a)
1. cultural/aesthetic / leisure, reasons;
 2. moral/ethical, reason ; e.g. right to exist/prevent extinction;
 3. resource materia ; e.g. wood (for building)/fibres for clothes/food for humans/(herbal) medicine
 4. (eco)touri ;
 5. economic benefi ;
 6. ref. resource / species, may have use in future/ ;
e.g. medical u
 7. maintains, food web / food chains;
A description
 8. nutrient cycli ;
 9. protection against erosi ;
 10. climate stabil ;
 11. maintains, (large) gene p /genetic variation;
 12. scientific resea ;

[max 7]

CHEMISTRY ONLINE
— TUITION —

(b) *advantages* (max 5)

- 13. can monitor health of mother;
- 14. can monitor development of foetus;
- 15. storage of, sperm/eggs/gametes;
- 16. artificial insemination;
- 17. ;
- 18. ref. surrogate mothers;
- 19. international cooperation;
- 20. genetic records kept;
- 21. can prevent extinction/extend range of a species/used in restoring ecosystem;

disadvantages (max 5)

- 22. unnatural environment;
- 23. stress in captivity;
- 24. behaviour changes;
- 25. reproductive cycles disrupted;
- 26. may reject selected mate;
- 27. examples of problems with release ;;
- 28. difficulty in finding food
may not integrate into groups
more susceptible to disease
very little natural habitat left to release animals into

[max 8]

[Total: 15]