

# **Mark Scheme for June 2010**

---

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

Question	Expected answers	Marks
1 (a) (i)	aperture – line to top right of diagram	1
	protoconch – line to centre of the fossil (first whorl)	1
	rib – to any of the curved lines dividing up the cephalopod	1
(ii)	planispiral / in one plane / evolute	1
(b) (i)	ammonitic must be complex with frills	1
	goniatitic should be simple with no frills and rounded or angular curves	1
	saddles / lobe labels	1
(ii)	nautiloid	1
(iii)	body chamber – houses soft parts / head/ tentacles /AW	1
	septa – divides shell into chambers	1
(iv)	named change eg septal necks / position of siphuncle / ornament stated	1
	description / diagram of early form to show morphological change chosen	1
	<ul style="list-style-type: none"> <li>• septal necks point back/<i>retrosiphonate</i></li> <li>• siphuncle central</li> <li>• no ribs</li> </ul>	
	description / diagram of late form to show morphological change chosen	1
	<ul style="list-style-type: none"> <li>• septal necks point forward near aperture/<i>prosiphonate</i></li> <li>• siphuncle lateral/<i>ventral</i></li> <li>• ribs / complex venter / labrum</li> <li>• <i>uncoiled forms/heteromorphs</i></li> </ul>	
(c)	<u>Vertical movement</u> control gas / fluid levels in chambers/ <i>uses siphuncle</i> ; movement of ions cause osmotic effects; increased gas movement upwards /more water movement downwards; buoyancy controlled by movement of water in and out of chambers	Any 2
	<u>Horizontal movement</u> jet propulsion; water forced out of hyponome/ <i>funnel</i> ; propels animal backwards; <i>uses tentacles to swim or pull along sea floor</i>	Any 2
(d)	actively hunt / catch prey using tentacles / beak breaks up food / may scavenge from sea floor	Any 2

Question	Expected answers	Marks
2(a) (i)	trilobite / <i>Trilobita</i>	1
(ii)	compound eye – fossil B on cephalon either side of glabella	1
	genal spine – fossil C running alongside thorax	1
	glabella – central portion of either B or C	1
	facial suture - <u>line</u> on cheek of fossil B i.e. <i>must not end on cheek</i>	1
(iii)	bottom portion below thorax in area of fused segments (area with 3 spines) <i>only accept on B</i>	1
(b) (i)	gill – area between pleuron and appendage	1
	jointed appendage – leg area on bottom of diagram	1
(ii)	walked / ran / crawled;	1
	using appendages / <i>legs</i>	1
(c)	<b><u>Nektonic</u></b>	
	Separated pleura;	
	Allow greater surface area to float / greater flexibility to swim	1
	more than 6 pleura so many legs	
	greater flexibility to swim / directed movement	1
	inflated glabella;	
	floatation device to remain in water column	1
	spines present;	
	for protection from predators	1
	<i>eyes on anterior margin</i>	
	<i>allows forward + up/down vision/ “360 vision”</i>	1
	Allow max one if written for planktonic	Max 2
	<b><u>Infaunal</u></b>	
	no eyes / blind	
	eyes not needed either nocturnal or live in burrow (shallow) / deep water	1
	pitted cephalon / sensory hairs present;	
	allow animal to make sense of environment / detect currents	1
	Large shovel shaped cephalon;	
	Burrowing into sediment / increase surface area on soft sediment	1
	<i>Extended genal spines</i>	
	<i>Spread weight in soft sediment / stabilise / snowshoe effect</i>	1
		Max 2
	<b><u>planktonic</u></b>	
	Small body / small and light / few mms long	
	small for floating in water column	1
	few thoracic segments / few legs as no directed movement	
	no need for flexibility / movement	1

Inflated glabella and or pygidium / fat or gas filled / separated pleura  
For buoyancy in water column

1

No eyes / blind

Eyes not needed as just floating / no directed movement

1

Responses in pairs – one for each morphological adaptation

Max 2

16

Question Expected answers

Marks

3(a) (i)  $13 + 5 = 18\%$ 

1

(ii) 2 bars correct = 1 mark  
3 or 4 bars correct = 2 marks

2

(iii) low energy conditions / quiet shallow area / AW;

1

no thick shelled forms / thin shelled forms only  
mostly whole shells / 60% whole  
marine swimmers such as belemnites and ammonites may indicate fallout

2 max

(b) (i)

	brachiopod	bivalve
lophophore	✓	✗
ligament	✗	✓
permanent gape between shells	✗	✓
made of $\text{CaCO}_3$	✓	✓
diductor and adductor muscle scars	✓	✗
zig-zag commissure	✓	✗

5 or 6 correct = 5 marks

2 correct = 2 mark

1 correct = 1 mark

Mark in ticks

4 correct = 4 marks

3 correct = 3 marks

5

(ii) recognisable elongate shell drawn *and labelled* (eg *Mya* or *Solen*)

1

suitable labels from muscle scars, dentition, deep pallial sinus, left or right valve (as appropriate) teeth and sockets, ligaments

any 2

(iii) byssus – horny thread on outside of shell

cement – on base of shell / left valve attachment

thick / heavy shell – to stay on the sea floor

*Large adductor muscle scars – to hold valves closed*

any 2

Question	Expected answers	Marks
4(a)	(i) present day reefs in equatorial / tropical regions we assume that old reefs had same requirements as new ones past reefs existed on equator / tropics / AW rocks moved away from equator on continents / <i>continental drift</i> today's reefs will move away from equator eventually with plates	any 3
	(ii) just below sea level / shallow water / approximately 15m depth / <30m clear water / for light photosynthesis of algae that live within them / sediment clogs coral polyps high energy levels / high oxygen levels fully marine / 30 – 40 ppt salts / normal salinity water temperature between 23 and 29°C. / tropics  If students say warm, shallow sea = one mark	any 3
	(iii) recognisable rugose coral  suitable labels from tabulae, corallite, dissepiments, symmetry labelled as bilateral, columella / <i>axial structure</i> , minor septa and major septa , <i>calice</i>	1  any 2
(b)	(i) plant / named plant	1
	(ii) gastropod / spider / other named plant / named terrestrial organism / amphibian / insect / <i>reptile</i>	1
	(iii) low energy environment / deltaic; marsh / bog / swamp; description of cyclothem development; rapid sedimentation / buried in fine sediments; plants fall into anoxic / anaerobic environment; low amount / no bacterial action;	Any 3

14

Question	Expected answers	Marks
5(a)	<b>Main characteristics</b>	
1	235 to 251 Ma before present	1
2	decline was gradual / over several Ma	1
3	largest decline in shallow sea dwellers / open sea dwellers less affected	1
4	evaporites / desert sediments <i>are poor conditions for life</i>	1
5	96% (allow 90 – 98%) marine invertebrate species extinct	1
6	extinction of marine life: e.g. trilobites, corals (tabulate / rugose)	1
7	reduction in numbers of other fossils e.g. ostracods, foraminifera, brachiopods, cephalopods, crinoids, bryozoans	1
8	extinction of terrestrial life: e.g. large amphibians, 77% of tetrapods	1
9	reduction in numbers of 'coal measures' fauna / pteridophytes	1
10	diagram / graph to show number of species and extinctions	1
		Max 6
	<b>Possible Causes</b>	
11	assembly of supercontinent Pangaea	1
12	sea levels fell / regressions	1
13	related to large scale glaciations (e.g. Australia, S America, S Africa, India, Antarctica)	1
14	seas hypersaline / <i>pH change</i>	1
15	lack of habitat / reduced shallow seas	1
16	large scale volcanicity (e.g. in Siberia)	1
24	poisonous gas emissions / named gases kill organisms	1
17	acid rain / ash falls described	1
18	led to fluctuations in climate / explanation of climate change with reason	1
19	disruption to food chains described	1
20	possible methane hydrates (in sediments on sea bed) release	1
21	plate tectonics / palaeomagnetic studies provides evidence for Pangaea	1
22	possible iridium layer / possible meteorite impact	1
23	Any other correct cause	1
		max 7

12



Question	Expected answers	Marks
5(b)	<b><u>way up criteria</u></b> description of suitable example (eg desiccation cracks, rootlets, burrows, grading, sole structures, pillow lavas) labelled diagram of chosen way up structure diagram has labels showing age relationship / younger and older rocks explanation of how upper is distinguished from lower use of way up structure in structural geology / inverted beds / overfold / recumbent fold <i>Allows use of Superposition to determine relative age of strata</i>	1 1 1 1 1 1 Max 5
	<b><u>included fragments</u></b> suitable example (eg xenolith, inclusion, derived fossil, conglomerate) labelled diagram of chosen example diagram has labels showing younger and older rocks / age relationship explanation why fragment is older	1 1 1 1 Max 4
	<b><u>cross cutting relationships</u></b> description of suitable example (eg dyke, unconformity, cross bedding) labelled diagram of chosen cross cutting relationship diagram has labels showing younger and older rocks / age relationship explanation of distinguishing way up / how upper is distinguished from lower / oldest from youngest explanation why cross cut rock is older ora	1 1 1 1 1 Max 5

11

## QWC

2 marks	Answers are structured clearly and logically, so that the candidate communicates effectively, uses a wide range of specialist terms with precision and spelling, punctuation and grammar are accurate.
1 mark	There are shortcomings in the structure of the answer, however, the candidate is able to communicate knowledge and ideas adequately, a limited range of specialist terms are used appropriately and spelling, punctuation and grammar are generally accurate with few errors.
0 marks	There are severe shortcomings in the organisation and presentation of the answer, leading to a failure to communicate knowledge and ideas. There are significant errors in the use of language, spelling, punctuation and grammar which makes the candidate's meaning uncertain.

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

© OCR 2010