



Cambridge O Level

MARINE SCIENCE

5180/01

Paper 1 Structured

October/November 2020

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **12** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

- This mark scheme will use the following abbreviations:

;	separates marking points
/	separates alternatives within a marking point
()	contents of brackets are not required but should be implied / the contents set the context of the answer
R	reject
A	accept (answers that are correctly cued by the question or guidance you have received)
I	ignore (mark as if this material was not present)
AW	alternative wording (where responses vary more than usual, accept other ways of expressing the same idea)
AVP	alternative valid point (where a greater than usual variety of responses is expected)
ORA	or reverse argument
<u>underline</u>	actual word underlined must be used by the candidate (grammatical variants excepted)
MAX	indicates the maximum number of marks that can be awarded
+	statements on both sides of the + are needed for that mark
OR	separates two different routes to a mark point and only one should be awarded
ECF	error carried forward (credit an operation from a previous incorrect response)

Question	Answer	Marks														
1(a)	species A = protista / protoctista ; species B = animalia / animals ; species C = plantae / plants ;	3														
1(b)	<table border="1"> <thead> <tr> <th>feature</th> <th>organisms</th> </tr> </thead> <tbody> <tr> <td>photosynthesize</td> <td>A + C + D ; (Ignore G).</td> </tr> <tr> <td>chordate</td> <td>B + E + J ;</td> </tr> <tr> <td>reptile</td> <td>E ;</td> </tr> <tr> <td>flowering plant</td> <td>C ;</td> </tr> <tr> <td>cnidarian</td> <td>G ;</td> </tr> <tr> <td>have tube feet</td> <td>H + F ;</td> </tr> </tbody> </table>	feature	organisms	photosynthesize	A + C + D ; (Ignore G).	chordate	B + E + J ;	reptile	E ;	flowering plant	C ;	cnidarian	G ;	have tube feet	H + F ;	6
feature	organisms															
photosynthesize	A + C + D ; (Ignore G).															
chordate	B + E + J ;															
reptile	E ;															
flowering plant	C ;															
cnidarian	G ;															
have tube feet	H + F ;															

Question	Answer	Marks
2(a)	X = crust ; Y = mantle ; Z = core ;	3
2(b)	<i>any 3 of:</i> crust is, broken into / is made from + plates / smaller parts ; (plates) floating / moving on the surface of (mantle) ; on liquid mantle ; ref. to <u>convection</u> , (currents / cycles / flow) ;	3





Question	Answer	Marks
3(a)	corallite ; zooxanthellae ; photosynthesis ; tentacles ; stomach ;	5
3(b)	<i>any 3 of:</i> idea of, adults, release / put into water column ; eggs and sperm ; at the same time ; fertilisation ; correct ref. to haploid gametes ;	3

Question	Answer	Marks												
4(a)	<table border="1"> <thead> <tr> <th>part</th> <th>name</th> <th>function</th> </tr> </thead> <tbody> <tr> <td>A</td> <td><u>gills</u> ;</td> <td>obtain oxygen (from water) / put oxygen into blood / removal of carbon dioxide / gas exchange ;</td> </tr> <tr> <td>B</td> <td><i>swim bladder</i></td> <td>Buoyancy / AW ;</td> </tr> <tr> <td>C</td> <td>heart ;</td> <td><i>pumps blood around the body</i></td> </tr> </tbody> </table>	part	name	function	A	<u>gills</u> ;	obtain oxygen (from water) / put oxygen into blood / removal of carbon dioxide / gas exchange ;	B	<i>swim bladder</i>	Buoyancy / AW ;	C	heart ;	<i>pumps blood around the body</i>	4
part	name	function												
A	<u>gills</u> ;	obtain oxygen (from water) / put oxygen into blood / removal of carbon dioxide / gas exchange ;												
B	<i>swim bladder</i>	Buoyancy / AW ;												
C	heart ;	<i>pumps blood around the body</i>												
4(b)	<i>any 1 of:</i> other means of buoyancy ; some species don't require one due to constant forward swimming (e.g. tuna) swim continuously / pectoral fins provide lift ; contain (body) fat ; (fat is) less dense than water (so provides lift) ; (plausible) AVP ;	1												
4(c)(i)	many fish (swim / located close) together ;	1												

PUBLISHED

Question	Answer	Marks
4(c)(ii)	<p><i>any 2 of:</i> many eyes search better; to look for predators ; for food / increases chance of finding food ; many potential mates ; so greater chance of reproduction ; increased hydrodynamic efficiency / less energy expended in movement ; lower chance of being eaten / confuses predator ;</p>	2

Question	Answer	Marks
5(a)	(controlled breeding) growing + harvesting of (a named) aquatic organisms ;	1
5(b)	<p>environmental – idea of, detritus / fish waste / excess food, from cages, removed / eaten / less pollution ;</p> <p>economic – idea of, a secondary harvest / increases income without much monetary input / cost effective ;</p>	2
5(c)	<p><i>any 4 of:</i> (growth promoting) gene / DNA, isolated ;</p> <p>from different species ;</p> <p>ref. to adding gene to (fertilised) trout eggs / at early stage of development / embryo ;</p> <p>eggs develop into GM / GE trout;</p> <p>ref. to correct method ;</p>	4

Question	Answer			Marks
6(a)		name of stage	stage order	5
		combustion / ignition / power / AW ;	3	
		exhaust / outlet / outtake AW ;	4	
		compression / AW ;	2	
	intake / induction / suction / AW ;	1		

all stages in correct numerical order ;

PUBLISHED

Question	Answer	Marks
6(b)(i)	<i>any 3 of:</i> net set at given depth ; fish / organism (larger than the aperture of the net), caught / entangled, by gills (in the net) ; idea of, weights / anchor / sinker (to set net depth) ; idea of buoys to mark location of net / help set depth ; attach dolphin scarers to nets ;	3
6(b)(ii)	catching of, non-target / unwanted species, or named examples ;	1
6(c)	<i>any 3 of:</i> attracts phytoplankton / algae / seaweed ; attracts fish ; idea of, sets up a food chain / ecosystem ; larger species (or named species) come to feed ; <u>more large</u> fish in that area ;	3

Question	Answer	Marks
7(a)	<i>any 3 of:</i> carbohydrates / polysaccharides ; (dietary) fibre / roughage ; water ; vitamins ; minerals / salts / ions ;	3
7(b)	cod + crab ;	1
7(c)	(<i>lipids</i>) insulation / energy storage / protection of organs / waterproofing ; (<i>protein</i>) growth / tissue repair / for muscles / enzymes / hormones / antibodies ;	2
7(d)	amino acids ;	1

Question	Answer	Marks
8(a)(i)	light ;	1
8(a)(ii)	zooplankton ;	1
8(b)	<i>any 3 of:</i> feed on / digest / break down ; dead / organic matter / named, e.g. ; releasing, nutrients / minerals / named, e.g. ; to be used / taken up by, organisms / producers ;	3
8(c)(i)	35 ;	1
8(c)(ii)	<i>any 2 of:</i> respiration ; movement ; faeces ; egestion / defecation / decomposition / decay / rotting ;	2

PUBLISHED

Question	Answer	Marks
9(a)	prevent / reduce / control + trade + in endangered / threatened species / organisms on Red List ; OR ensure trade + of (wild) animals + plants + doesn't threaten their survival ;	1
9(b)	<i>any 3 of:</i> hunted for, food / meat OR eggs taken for food ; killed for tourist curios / named examples ; taken for aquaculture trade ; light pollution disrupts nesting ; pollution due to (plastic) litter – idea of eat plastics / litter and starve OR become entangled in, plastics / ghost nets + drown / strangle it ; becomes bycatch ; reduction in nest sites available due to, coastal development / infrastructure built ; global warming, increases sand temperatures / increases sea levels, disrupts breeding ;	3
9(c)	fishing / human activities + prohibited / illegal ;	1

Question	Answer	Marks
10(a)(i)	frozen ;	1
10(a)(ii)	<i>any 2 of:</i> (transport) takes time / AW ; fish start to spoil / named type of spoilage ; product may not meet required, quality / standard / taste / texture / colour / smell, when it reaches destination ; less profitable / loses value ; tuna contain microorganisms ;	2
10(b)(i)	<i>any 2 of:</i> supply / surplus / shortage ; demand ; quality ;	2

PUBLISHED

Question	Answer	Marks
10(b)(ii)	ADV: improve quality selected or purchased /choose only the best or biggest fish / gain reputation for high quality product / maintain supply ; DIS: high cost to company / manufacturer / consumer / could reduce demand as price too high / reduced profit / quality doesn't match price ;	2
10(c)	increases ;	1
10(d)	where goods / services; can be bought / sold;	2