

# Food Production

## Mark Scheme 1

<b>Level</b>	IGCSE(9-1)
<b>Subject</b>	Biology
<b>Exam Board</b>	Edexcel IGCSE
<b>Module</b>	Double Award (Paper 1B)
<b>Topic</b>	Use of Biological Resources
<b>Sub-Topic</b>	Food Production
<b>Booklet</b>	Mark Scheme 1

**Time Allowed:** 58 minutes

**Score:** /48

**Percentage:** /100

**Grade Boundaries:**

9	8	7	6	5	4	3	2	1
>90%	80%	70%	60%	50%	40%	30%	20%	10%

Question number	Answer	Notes	Marks
1	C different temperatures / eq; O same species / size/ age/gender/eq; R repeat / eq; M1 mass / length / number / eq; M2 time period <u>stated</u> ; (one day minimum) S1 and S2 same food type / same food mass / same oxygen / tank size / fish density stated / eq;;		6
		<b>Total</b>	6

Question number	Answer	Notes	Marks
2 (a) (i)	genes / alleles / eq; inherited / passed on / eq; parent/offspring height described;  reduce growth; <u>compete</u> ; light / minerals / water / carbon dioxide / eq;	eg tall / short / big / small / high / low  allow nutrients / moisture	max 2
	(ii) improve growth; decomposition / decomposers / eq; minerals / named mineral / nutrient / salts / ions / ammonium / nitrogen fixing / nitrifying;  or  reduce growth; infection / disease / attack / harm / eq; pathogen;	ignore nitrogen  ignore use nutrients	max 2

(b)	(i)	unwanted plant / of no use / described reason for not wanted / eq;		1
	(ii)	(less) <u>competition</u> ; light; carbon dioxide; water; minerals / nutrients / salts / ions / eq;	ignore space	max 2
	(iii)	herbicide / weedkiller / chemical that kills / pesticide / eq; pull them up / eq;		max 1

**TOTAL 8 MARKS**

Question number	Answer	Notes	Marks
3	<p>control intraspecific predation / control overcrowding / separate sizes / separate ages / eq;</p> <p>control interspecific predation / killing predators;</p> <p>control disease / infection; antibiotics / remove dead fish; biological control of pests / eq;</p> <p>control oxygen; remove waste products;</p> <p>frequent feeding / feed small amounts; (high) <u>protein</u> diet;</p> <p>selective breeding / eq; hormones;</p>	ignore clean water	max 6

**TOTAL 6 MARKS**

Question number	Answer	Notes	Marks
4 (a) (i)	1. beef increases; 2. fish slow/constant/steady/little change <u>and</u> then increase rapidly / eq; 3. more beef than fish at start; 4. more fish than beef at end / fish overtakes beef;	2. must have slow and then rapid	Max 3
(ii)	13 x 6 = 78 / range between 72 and 84;;	allow one mark for x 6 in working	2
(b)	1. <u>digestion</u> / <u>digested</u> / <u>digest</u> ; 2. protease / pepsin; 3. hydrochloric acid / HCl; 4. low pH / pH 2 / optimum pH; 5. amino acids / peptides;	1. gnore breakdown allow physical or chemical digestion 2. gnore enzyme digestive enzyme = 1 4. ignore best pH	Max 4

Question number	Answer			Notes	Marks
(c)	Protein molecule	Function of protein molecule	Place where protein molecule is made	ignore control ideas  allow blood sugar	6
(haemoglobin)	transport oxygen / carries oxygen / bind to oxygen;	(red blood cells)			
amylase / carbohydrase;	(digest starch)	(salivary gland)			
(insulin)	lower <u>blood</u> glucose / glucose to glycogen / cells absorb glucose;	pancreas;			
antibody;	(binds to antigens on pathogens)	white blood cell / lymphocyte;			

Total 15 marks

Question number	Answer	Notes	Marks
5 (a)	<p>1. (individual fish) can control size / age / mass / species / growth / faster production / grow faster / control health / control disease / control protein content / control feeding / control quality of fish;</p> <p>2. can selectively breed / genetically modify;</p> <p>3. reduce overfishing / does not reduce wild stocks / sustainable / less risk to food chains / less chance of catching other species / less chance of catching rare fish / prevent extinction;</p> <p>4. high yield / large numbers of fish / guaranteed harvest / regular supply / available all year;</p> <p>5. safer / less risk for fishermen / eq;</p>	<p>ignore cheaper</p> <p>4. ignore less time consuming / easier to catch</p>	<p>Max 2</p>



(b)	(i)	fewer pathogens / bacteria / algae / less eutrophication / less fertiliser / less sewage / less human waste / less faeces / less chance of disease / less chance of infection / eq;	ignore cleaner / less minerals / less waste / less pollutants / less contamination	1
	(ii)	1. humans do not want to eat antibiotics; 2. passes along food chain / bioaccumulation; 3. less chance of (bacteria) resistance;	ignore safer to eat / cost / rivers / environment	Max 2

Question number	Answer	Notes	Marks
5 (c) (i)	37.9 / 38 / 38.0 %;;	allow if in table allow one mark for 1.1 as numerator / 2.9 as denominator in working / 37.93;	2
(ii)	<p>C traditional and new type of farm;</p> <p>O (waste from) same species / same fish / same number / mass / age / size / same size of fish farm / eq;</p> <p>R repeat experiment;</p> <p>M1 (what is measured): mass of algae / mass of pondweed / oxygen level / CO<sub>2</sub> level / nitrate level / phosphate level / mineral level / turbidity / biodiversity / number of species / number of fish / number of organisms / eq;</p> <p>M2 same time of day / same time of year / each month / same length of sampling time / eq;</p> <p>S1 same mass of food (in farm / tank) / same type of food / same diet / same antibiotics;</p> <p>S2 same distance from farms / same depth in water / same light / temperature;</p>	allow amount	Max 6