WJEC (Eduqas) A-level Biology
Topic 1.6: Human Impact on the Environment
Questions by Topic - Mark Scheme

1.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			1. Overfished has increased **and** fully fished has increased **and** underfished has decreased (1) 2. fish stocks are decreasing/ some species could become extinct (1) 3. (because) increase in unsustainable fishing and a decrease in sustainable fishing (1) 4. Since 2007 overfished/biologically sustainable have stayed constant/ plateaus (1) 5. within sustainable fishing more fully fished and fewer underfished stocks (1) 6. Correct use of data in any mark point (1)			4	4		
	(b)			• Restricted/minimum net mesh size so don't catch {young/ smaller} fish (1) • Exclusion zones/Seasonal restrictions {so don't catch breeding fish/juveniles/ so stocks can recover}(1) • {Quotas/Smaller fleets} so less fish caught (1) Ignore ref to fishing for non-traditional species	3			3		
	(c)	(i)		Closely packed so {lice/ parasites/ infection} can easily spread from fish to fish (1) NOT disease Cannot be easily killed as resistant to pesticides (1)		2		2		
		(ii)		**Any three (x1) from:** • Foreign species into new areas/invasive species/ displace indigenous species / decrease biodiversity / reduce wild fish numbers/diversity of species (1) • Compete qualified (e.g. for food/ mates/ habitat)/affect food chains (1) • spread disease/ infection/ parasites to wild/ native fish (1) • Breed with the wild fish **and** reduce genetic diversity/ dilute the gene pool/ threaten the long-term survival of wild species/ cause wild species to go extinct (1)		3		3		
				Question 6 total	**3**	**5**	**4**	**12**	**0**	**0**

2.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)			(A species that is seriously) at risk of extinction	1			1		
	(b)			**Any 2 (x1)from:** • {restores/ increases/ improves} biodiversity/ increases (fresh)water habitats (by pond formation)/ increases shrub growth/insect life (1) • Reduces flooding/ reduces damage to habitats/ slows water flow/ filters sediment from water (1) • Use of European beavers: maintains correct genetics of population/ well adapted to environment/ take up correct niche (1)		2		2		
	(c)			**Any 2 (x1) from:** • Introduction of {disease/TB} (1) • {Destruction/ loss} of {land/ habitat} due to {flooding/ bogs/ reduced flow of rivers (below the dams)/ deforestation} (1) • The wrong species would not be so well adapted/ inappropriate habitat for beavers (1)		2		2		
	(d)			• Habitat: The receiving habitat is suitable or example/ effect of beaver introduction on {habitat/ biodiversity} (1) **Any 1 (x1) from:** • Research: The resources and expertise are available for the establishment/ protection (1) • Consultation: with neighbouring landowners and local stakeholders indicates that the majority of those consulted do not oppose reintroduction/eq (1) • Correct beavers: A suitable disease free donor population of Eurasian beavers is identified/ correct species is re-introduced (1)		2		2		
				Question 1 total	**1**	**2**	**4**	**7**	**0**	**0**

3.

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)		Safe operating level for humanity/ a threshold value for a global process that is affected by human activity/ limits that global processes or systems must stay within (1) Above this value, the global process will not be stable / below this value the global process will be stable /exceeding boundary leads to gross global environmental change/ irreversible damage if exceeded (1)	2			2		
	(b)		396.5 – 350 = 46.5 46.5 x 100 (1) 350 = 13.3 (1) Correct answer = 2 marks-+9 13.29/ 13.286/ 13 = 1 mark		2		2	2	
	(c)		• Deforestation reduces carbon dioxide uptake (1) • {Burning of felled trees/ transport of felled trees/ use of fuels in processing trees} puts carbon dioxide into the atmosphere/ (1) • Decay of waste tree material (1)		3		3		
	(d)		A. In a changing environment, some species' adaptation {became unsuitable/ they were selected against} (1) B. Cannot {adapt/ evolve} in a relatively short period of time/ {Animals cannot move fast enough/ seeds cannot disperse quickly enough} to another habitat where they were suitably adapted/ Correct reference to slow mutation rates(1) C. Increased {human population/ industry/ pollution} is causing environmental change (1)		3		3		

Question			Marking details	Marks available					
3	(e)		Any 4 (x1) from: A. {Seed / sperm/ gene} banks/ rare breed societies (1) B. Breeding programmes (1) C. Fishing quota/ mesh size/ exclusion zone/ ref to seasons (1) D. Trade restrictions/ legislation/ CITES(1) E. Management {of wild populations/ practices} (1) F. Restrict habitat destruction / pollution / deforestation / other means of habitat destruction (1) G. SSSIs/ National parks/ conservation areas/ education/ ecotourism/ NGOs (1) education/ ecotourism and NGOs must be qualified m	4			4		
			Question 3	**6**	**8**	**0**	**14**	**2**	**0**

4.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			1 455/ 1 456/ 1 455.5 = 3 marks If incorrect award 1 mark for each of any number divided by 2 (to show breeding pairs) any number multiplied by 1 025/100 or 10.25		3		3	3	
	(b)			A. Fewer predators (1) B. Less intraspecific competition (1) C. for food/ nest sites/habitat (1) NOT space/ resources D. Less likely to pass on disease as fewer numbers (initially) (1)		3		3		
	(c)			Theft of {eggs/chicks}/ poachers/ hunting		1		1		
	(d)			Any **two** (×1) from A. Prosecution/ legislation/ ban hunting (1) B. Education/ increase awareness/ ecotourism (1) C. Making holding of poisons illegal/difficult to obtain (1) D. Feeding sites (1) E. Breeding programmes (1)		2		2		
	(e)			Site of Special Scientific Interest (1) SSSIs protected from development or other damage (1)	1	1		2		
				Question 6 total	**1**	**10**	**0**	**11**	**3**	**0**

5.

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths *	Prac **
7				**Indicative content** **Eutrophication** • The nitrogen in the food fed to the fish may be lost as uneaten food, in faeces and as ammonia. • The extra N and P in the water can be used by algae to grow. This algal bloom at the water surface can block light to the aquatic plants in the deeper water. • With no light, these plants cannot photosynthesise and so die. • Decomposers (bacteria and fungi) will then decompose the dead organic matter. They use (aerobic) respiration and so use up oxygen from the water. • The water becomes deoxygenated and fish and other oxygen requiring species die. • Anaerobic bacteria may start to reduce nitrates (denitrification) **Other impacts of fish farming** • The farmed fish tend to be packed tightly into a small area. • This can lead to diseases passing through the population quickly and these can spread to the local wild fish population. • To keep the stock healthy antibiotics are used. This can lead to antibiotic resistant bacteria developing. • Pesticides used to kill the parasites may also be toxic to some of the local marine invertebrates. • Farmed fish may have a selective advantage over wild species **Methods of preventing overfishing** • Net mesh sizes may be restricted. Larger mesh sizes allow immature fish to escape and they can go on to interbreed. • Closed seasons for fishing are also enforced. These will be at times of the year when fish are breeding so again the stocks are replenished. • Quotas - agreements which limit the catches brought ashore. • Around the coast there are exclusion zones where fishing is not allowed. These areas allow fish to reproduce without being caught. • Landing size regulations have been introduced which only allowing fish of a certain size to be caught. This allows some fish to return for breeding. Fishing of non-traditional varieties e.g. coalfish, has allowed stocks of other fish to recover.	5	4		9		
				7-9 marks Detailed explanation of eutrophication **and** Detailed explanation of other impacts of fish farming **and** Detailed explanation of methods of preventing overfishing *The candidate constructs an articulate, integrated account, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses scientific conventions and vocabulary appropriately and accurately.* **4-6 marks** Any two from Explanation of eutrophication Explanation of other impacts of fish farming Explanation of methods of preventing overfishing *The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate usually uses scientific conventions and vocabulary appropriately and accurately.* **1-3 marks** Brief explanation of eutrophication **or** Brief explanation of other impacts of fish farming **or** Brief explanation of methods of preventing overfishing *The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate has limited use of scientific conventions and vocabulary.* **0 marks** *The candidate does not make any attempt or give a relevant answer worthy of credit*						
				Question 7 total	**5**	**4**	**0**	**9**	**0**	**0**