Qualification: 0173-007/507 Level 3 Technical in Land and Wildlife Management– Theory Exam

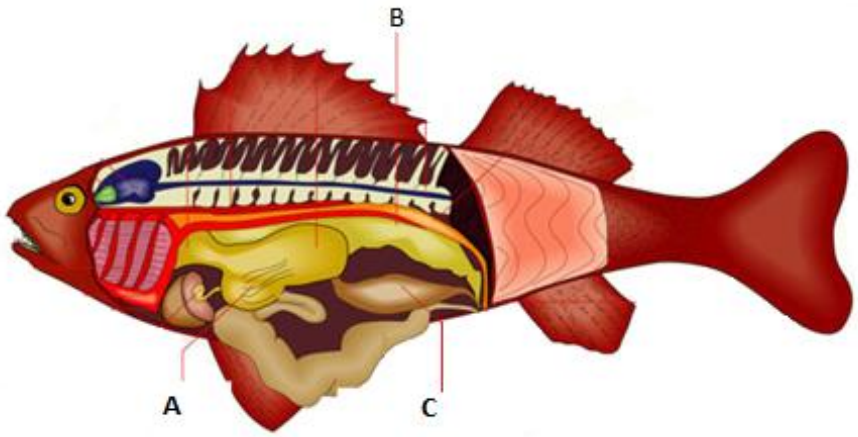
March 2019

<table>
<tr><td>1</td><td colspan="3">List two physical and two chemical parameters that can be measured to analyse the condition of a water body.</td></tr>
<tr><td></td><td>Acceptable answer(s)</td><td>Guidance</td><td>Max mks</td></tr>
<tr><td></td><td>Physical:
• water quantity
• flow
• temperature
• turbidity
• geographical features
• surface topographical features

Chemical:
• dissolved oxygen
• pH
• ammonia
• nitrite
• nitrate
• hardness
• chlorine
• Salinity</td><td>1 mark each (up to 2 marks)

1 mark each (up to 2 marks)</td><td>4</td></tr>
<tr><td>2a</td><td colspan="3">Define the Water Framework Directive.</td></tr>
<tr><td></td><td>Acceptable answer(s)</td><td>Guidance</td><td>Max mks</td></tr>
<tr><td></td><td>A European Union Directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies.</td><td>1 mark for correct definition.</td><td>1</td></tr>
</table>

2b	Give **two** applications of the Water Framework Directive.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Water quality in rivers. • Coastal water quality • Protecting and improving aquatic bodies • Promote sustainable water use / monitors abstraction rate • Reduce impacts of floods and droughts	**1 mark for each point (up to 2 marks)** **Any other relevant answers.**	2
3	Define the River Invertebrate Prediction and Classification System (RIVPACS).		
	Acceptable answer(s)	**Guidance**	**Max mks**
	A system for assessing water quality in freshwater rivers based on the macroinvertebrate species found at the study site.	**Any other relevant answers.**	1
4	Explain how agriculture can affect water quality.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• excess nutrients/fertilisers in the water body/run-off from the agricultural land (1) • leading to algal bloom (1) • prevents sunlight penetration (1) • and kills flora in the water body (1) • suspended solids from bank side erosion (1) • manure leading to high ammonia content(1)	**1 Mark for each point (up to 4 marks)** **Any other relevant answers.**	4

5	Explain **three** ways how a deterioration in water quality can impact upon the flora and fauna found within an aquatic habitat.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• A deterioration in water quality can lead to a reduction in the diversity of species present (1 mark), as the water quality tolerance boundaries will be reduced. (1 mark) • A deterioration in water quality can lead to a reduction in the level of productivity of an ecosystem (1 mark), as the biomass may be reduced (1 mark) • A rapid deterioration in water quality can result in mortalities within an aquatic habitat (1 mark), as the water quality parameters may fall beyond those tolerated by some species present. (1 mark)	**2 marks per why reason up to max of 6.** **Accept any other relevant answers.**	6
6	Identify the internal features labelled A, B and C of the fish in Figure 1.  Source: www.infovisual.info **Figure 1**		
	Acceptable answer(s)	**Guidance**	**Max mks**
	A – Pyloric caecum **B** - air bladder/Swim bladder **C**- Gonad		3

7	List **three** effects on physiological systems of a fish during peak angling season.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Increased feeding load entering the digestive system • Decreased immunity in fish • Increased respiration due to lack of oxygen and catch rates • Increased stress levels effecting hormone production	**1 mark for each effect (up to 3 marks)** **Any other relevant answers.**	3
8	Give **three** reasons why fish swim erratically.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• playing or exercising • poor water quality, pH, ammonia, and nitrates • external parasite. • Predator prey interactions	**1 mark for each reason (up to 3 marks)**	3
9	State **four** symptoms of deficiencies and excesses of lipids in fish.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Reduced growth of the fish. • Skin de-pigmentation. • Fins erosion. • Rapid swimming is followed by immobility and loss of reflex. • Fish may float or sink to the bottom and then recover or die. • Ascetics moving away from other solitary hiding • the bulging eyes or the deformed vertebrae • Fat distended abdomen	**1 mark for each symptom (up to 4 marks)**	4

10	Using a suitable feeding regime for a named game fish species within a fresh water lentic environment, discuss the impact of the feeding regime on fish health and water quality.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Indicative content: • the feeding regime to cover important nutrients • feeding regime and its suitability to the selected fish • assess the impact on the fish health • impacts of over feeding leading to impact on water quality (link to nitrogen cycle) • increased ammonia • environmental sources on diet requirements	**Band 1 (1-3 marks)** The candidate has failed to propose a suitable feeding regime specific to the species chosen. The candidate has provided no rationale as to why they have proposed the nutrients required in the regime. There is minimal links to the environmental sources and the impact of the feeding regime on fish health. Candidate's response may have strayed from focusing on the relevant environmental sources and impact on water quality. The candidate's response lacks use of appropriate terminology. **Band 2 (4 - 6 marks)** The candidate has proposed a suitable feeding regime specific to the species chosen. The candidate has provided minimal rationale as to why they have proposed the nutrients required in the regime. There are good links to the environmental sources and the impact of the feeding regime on fish health. Candidate's response shows minimum focus on the relevant environmental sources and impact on water quality. The candidate's response shows fair use of appropriate terminology. **Band 3 (7 – 9 marks)** The candidate has proposed a suitable feeding regime specific to the species chosen. The candidate has provided detailed rationale as to why they have proposed the nutrients required in the regime. There are strong links made to the environmental sources and the impact of the feeding regime on fish health, with specific examples.	9

		Candidate's response shows good focus on the relevant environmental sources and impact on water quality. The candidate's response shows good use of appropriate terminology throughout.	