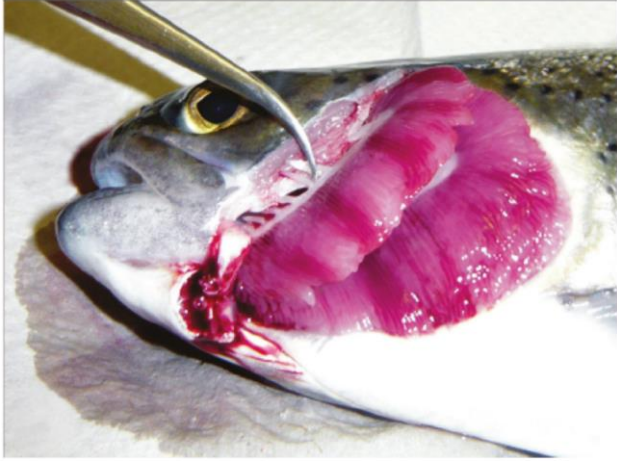


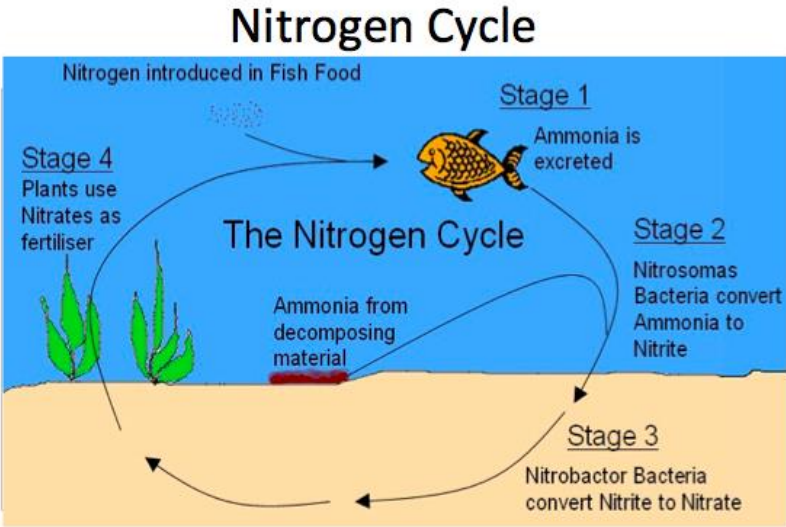
**Qualification: 0173-513/013 Level 3 Technicals Certificate in Land and Wildlife
– Theory Exam**

June 2018




1a	Name two nutritional disorders in fish.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following up to 2 marks: <ul style="list-style-type: none"> • Ocular disorder (1) • Vertebral deformity (1) 		2
1b	State the causes for the disorders identified in 1a).		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following up to 2 marks: <ul style="list-style-type: none"> • Ocular disorder- Vitamin A deficiency (1) • Vertebral deformity - Vitamin C deficiency (1) 		2
2	Explain three factors influencing the nutritional efficiency of a fish feed.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for naming a factor (1) and 1 mark for how they influence (1), up to 6 marks: <ul style="list-style-type: none"> • Storage of fish feed – improper storage could lead to spoilage/deterioration and cause infections/disorders • Nutritional composition of the feed – appropriate nutrients should be included based on fish species and fish health condition • Feeding regime – appropriate feeding times and quantities should be planned depending on fish and environmental factors. 	<i>Accept and award marks for any other appropriate response.</i>	6

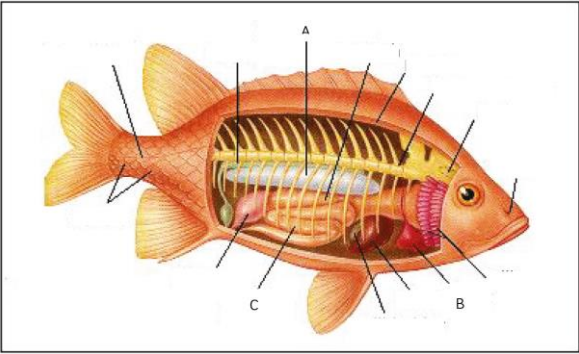
3	State two factors which cause Gas Bubble Disease.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following up to 2 marks: <ul style="list-style-type: none"> • Nitrogen Gas (1) • super saturation (1) • Pressure Changes (1) 		2
4a	Figure 1 below is an image of a fish with a gill disorder.		
			
	Identify the type of gill disorder shown in Figure 1.		
	Acceptable answer(s)	Guidance	Max mks
	Hyperplasia or lamellar fusion (1)	<i>Accept and award marks for any other appropriate response</i>	1
4b	Name two causes for the disorder identified.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following, up to 2 marks: <ul style="list-style-type: none"> • High ammonia levels (1) • High Heavy Metal levels (1) • Low oxygen levels (1) 		2

5	Define the term zoonotic disease with an example for such a disease in fish.		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 mark for definition:</p> <p>A disease that spreads from animal/fish to humans is a zoonotic disease. (1)</p> <p>1 mark for example:</p> <p>Example of such an infection in fish – Mycobacteriosis/Aeromonas. (1)</p>	<p><i>Accept either the casual organism or the infection as examples.</i></p>	2
6	Describe the environmental risks associated with use of antibiotics to treat fish diseases.		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 mark for each point, up to 3 marks:</p> <ul style="list-style-type: none"> • Affects the water quality/water source (1) • Damages to the bio filter maturity (1) • Antibiotic resistance (1) therefore making them ineffective for human treatments (1) • Residual antibiotic in fish used for human consumption (1) 	<p><i>Accept and award marks for any other appropriate response</i></p>	3
7a	Photosynthesis is a chemical process seen in plants. Identify a) gas produced as a by-product of photosynthesis		
	Acceptable answer(s)	Guidance	Max mks
	Oxygen/O ₂ /O ₂ (1)		1
7b	the gas used during photosynthesis		
	Acceptable answer(s)	Guidance	Max mks
	Carbon dioxide/CO ₂ (1)		1

7c	the chemical pigment used during photosynthesis		
	Acceptable answer(s)	Guidance	Max mks
	Chlorophyll (1)		1
7d	the carbohydrate produced during photosynthesis.		
	Acceptable answer(s)	Guidance	Max mks
	Glucose (1)		1
8	Draw a labelled diagram of the nitrogen cycle in an aquatic system.		
	Acceptable answer(s)	Guidance	Max mks
	 <p>4 stages of the cycle identified (4) The stages are in the correct order (1) Organisms identified correctly (1)</p>		6

9a	What are the three main groups of rock classified as?		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following, up to 3 marks: <ul style="list-style-type: none"> • sedimentary (1) • Igneous (1) • Metamorphic (1) 	<i>Accept alternative wording for the response</i>	3
9b	Describe the formation of two types of rocks listed in 9a).		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for the following, up to 6 marks: <ul style="list-style-type: none"> • Eg: sedimentary – weathering of pre-existing rocks - due to physical disintegration and chemical decomposition of rocks (1). These processes produce soil, unconsolidated rock components (1) which is dissolved in groundwater/is eroded away (1) eventually to be deposited as sediment (1). • Eg igneous - They are formed by the cooling of molten magma on the earth's surface.(1) Volcanic rock (1) partial melting of rocks within the mantle and crust (1) • Eg metamorphic - the minerals they contain are changed chemically(1), By being near molten rock (1) Or by pressure (1) 	<i>Accept alternative wording for the response</i>	6

10	<p>The image in Figure 2 below shows particles and their size and texture.</p> <div style="text-align: center;"> <p>A 0.05 to 2 mm feels gritty</p>  <p>B 0.002 to 0.5 mm feels smooth</p>  <p>C less than 0.002 mm feels sticky</p>  </div> <p>Name the soil particle B.</p>		
	<p>Acceptable answer(s)</p>	<p>Guidance</p>	<p>Max mks</p>
	<p>B – Silt (1)</p>		<p>1</p>
11a	<p>Fish farmers commonly feed fish to appetite, for the best growth rates, dependant on their behaviour.</p> <p>a) Name two types of behaviour that would encourage the fish farmer to feed.</p>		
	<p>Acceptable answer(s)</p>	<p>Guidance</p>	<p>Max mks</p>
	<p>1 mark for the following, up to 2 marks:</p> <ul style="list-style-type: none"> • Swimming (1) • Feeding & display (1) 		<p>2</p>
11b	<p>Name two types of behaviour that would discourage the fish farmer from feeding.</p>		
	<p>Acceptable answer(s)</p>	<p>Guidance</p>	<p>Max mks</p>
	<p>1 mark for the following, up to 2 marks:</p> <ul style="list-style-type: none"> • Escape Response (1) • Breeding (1) 		<p>2</p>

12	Name the three internal organs A, B and C in Figure 3.		
Acceptable answer(s)		Guidance	Max mks
A –Swim bladder (1) B – Heart (1) C – Intestine (1)			3
13	State one method used to reduce fish stress as a result of pH changes.		
Acceptable answer(s)		Guidance	Max mks
1 mark for 1 of the following: <ul style="list-style-type: none"> • Add Calcium Carbonate (1) • Siltex (1) • Micro-chalk (1) • RO filtered water (1) • Heavy metal filtering (1) 		<i>Accept and award marks for any other appropriate response</i>	1
14	Human land use affects environmental processes. Discuss the impact of human land use on aquatic environment and fish health.		
Acceptable answer(s)		Guidance	Max mks
Band 1: 1-4 marks Basic description, stating some examples of human land use that have negative effect on aquatic environments and fish health. Ability to outline some chemical waste products that pollute water courses. There will be little or no specialist terminology used. Answer may be disorganised and ambiguous.		Indicative content: <ul style="list-style-type: none"> • Abstraction – Habitat destruction All Physiological Processes 	12

	<p>Band 2: 5 - 8 marks Detailed description, demonstrating a sound understanding of human land use and the subsequent pollution impact on aquatic environments and fish health. Accurate details of the chemicals and waste products that effect flora and fauna, with some reference to habitat destruction. There will be some use of specialist terminology, although they may not always be used appropriately. The information is presented mostly in a structured format.</p> <p>Band 3: 9 - 12 marks Comprehensive description of catchment land use and ability to categorise the main types of activities and subsequent pollution impact on aquatic environments. Articulate ability to define the impacts of specified chemicals, on specific species and link this to catchment habitat destruction. Specialist terminology will be used correctly and appropriately throughout. Information will be presented in a well-structured format.</p>	<ul style="list-style-type: none"> • Acid Rain – All physiology i.e. reproduction ect • Sewage – Ammonia Respiration & Osmoregulation • Animal Waste • Human Waste • Heavy Metals – Respiration / Reproduction • Pesticides – Feeding/ Digestion • Herbicides - Reproduction • Fertilizers – Night Oxygen Levels (Respiration) • Detergents – Surface Tension (Prey & Feeding) • Oil Runoff – Hydrocarbons (Reproduction/DNA) • Hormones – Oestrogen (Reproduction) 	
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