Qualification: 0173-009/509 Level 3 Technical in Land and Wildlife Management – Theory Exam

March 2019

1	State any **three** stages of the hydrological cycle.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Storage in ice and snow (1) • Precipitation on land/ocean (1) • Surface runoff (1) • Infiltration (1) • Freshwater storage (1) • Ocean storage (1) • Groundwater flow (1) • Subsurface flow/throughflow (1) • Groundwater storage/water table (1) • Evapotranspiration (1) • Evaporation (1) • Condensation (1) • Percolation (1) • Also accepted interception (1)	**Any 3, up to 3 marks.**	**3**
2	State the major rock type that forms through deposition.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Sedimentary Rocks		1

3 Describe any **three** layers in the soil profile shown in **Figure 1.**

Figure 1

Source : http://www.diyinfozone.com

Acceptable answer(s)	**Guidance**	**Max mks**
• The top layer/O Horizon **(1)** dark in colour due to the high amount of organic matter present **(1)** • The E Horizon/pale/bleached/lighter layer **(1)** is where iron and aluminium oxides have leached out **(1).** • The iron pan **(1)** is red as some iron has percolated through **(1).** • The bedrock **(1)** is the parent material **(1)** Also accepted • Surface horizon – A • Subsoil -B • Substratum – C • Organic horizon –O • Hard Bedrock - R	**1 mark for identifying the layer up to 3 marks maximum. 1 mark for describing the layer up to a maximum of 3 marks.**	6

4	For each of the following UK locations, state the predominant rock type: **a)** Giant's Causeway **b)** Malham Cove **c)** Dartmoor Tors		
	Acceptable answer(s)	**Guidance**	**Max mks**
	a) Basalt b) Limestone c) Granite	**Also accept:** **a) basalt/igneous** **b) Limestone/sedimentary** **c) Granite/igneous**	3
5	Explain why photosynthesis is important for all animals.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Photosynthesis produces sugars **(1)** and as a by-product oxygen. **(1)** Animals need to eat the sugars for food. **(1)** Herbivores eat the plants **(1)** carnivores eat the herbivores **(1)** and they all need to breathe oxygen **(1)**	**1 mark for each, up to 5 marks.**	5
6	State **three** processes involved in the Nitrogen Cycle.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Fixation (1)/Nitrogen Gas (N_2) is fixed from the atmosphere by Lightning and/or Bacteria and converted into Ammonia (NH_3) **(1)** **Nitrification (1)**/Conversion of Ammonia (NH_3) into nitrites (NO_2) and Nitrates(NO_3) by Nitrifying bacteria **(1)** **Assimilation (1)**/Nitrates(NO_3) are taken up by plants **(1)** **Ammonification (1)**/Decaying biological matter is broken down into ammonium (NH_4+) and/or ammonia (NH_3) **(1)** **Denitrification (1)/**Nitrates (NO_3) are reduced/converted to release atmospheric Nitrogen (N_2) back to the atmosphere **(1)**	**Any 3 of, up to 3 marks.** **Also accept: decomposition** **Any other relevant answers.**	3

7	Explain how Wildfowl centres affect local environmental processes.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Grazing pressure from the wildfowl (1) can expose the soil (1) leading to increased run off/erosion (1). Increase in wildfowl droppings increases nutrients on the land (1) and eutrophication of the water (1).	**Any other relevant answers.**	3
8	Describe **three** features that indicate historic woodland status.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• woodland name **(1)** – name indicates woodland age. **(1)** • boundary shape **(1) –** irregular boundary **(1)** • wood banks **(1)** – presence of denoting boundaries/keeping livestock out **(1)** • out-grown hedges **(1)** – land has not been managed under agriculture recently **(1)** • ditches **(1)** - boundary features **(1)** • pits **(1)** – day holes/mining **(1)** • charcoal hearths **(1)** – evidence of charcoal production **(1)** • saw pits **(1)** - evidence of historic timber production **(1)** • tracks **(1)** – sunken tracks **(1)** • indicator species **(1)** – flora species **(1)**	**1 mark for the feature, up to a maximum of 3 marks. 1 mark for the description, up to a maximum of 3 marks.** **Also accept:** • **coppicing (1)** • **historic harvesting technique (1)** **Any other relevant answers.**	6
9	Explain **two** ways how an unmanaged woodland ride can be managed to improve its ecological structure.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Rotational cutting of grass and shrubs **(1)** in order to maintain the ecological structure **(1)** • Creation of 'V' shaped structure **(1)** in order to create graded edges/ecological structure **(1)**	**Up to 2 marks for management technique and up to 2 marks for its effect.** **Also accept:** scallops/D shape (1) in order to create varied woodland edge/ecological structure (1)	4

10	Describe **three** advantages of using planting instead of natural regeneration.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• You can choose the species (1) • You decide where you will plant them (1) • It is quicker to establish (1) • You have more control/not relying on natural processes (1)	**Also accept:** **decide age of plant to plant (1)** **Any other relevant answers.**	3
11	State **two** safety considerations when installing a bat box.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• appropriate use of PPE / hard hat (1) • falling from height (1) • dropping tools/equipment from height (1) • use of tools (1) • more than one person working together (1) • emergency arrangements (1) • complete a risk assessment (1)	**Any two, up to 2 marks.** **Also accept:** **appropriate training to complete the work (1)**	2
12	State **three** typical characteristics of an *r* breeding strategy.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Lives in unstable environments (1) • Small Body Size (1) • Short Life Span (1) • Has Many Offspring (1) • Early Sexual Maturity (1) • Little Parental Care (1) • Rapid Growth (1)	**1 mark for each characteristic, up to a maximum of 3 marks.** **Also accept:** **more than 1 partner (1)** **Can be almost independent at birth.** **Eyes open covered in down etc (1)** **Any other relevant answers.**	3

13	Give **three** reasons why polygamous mating systems often result in the development of aggressive behaviours.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• To defend a display ground/arena/territory **(1)** • To defend mates **(1)** • To physically intimidate/warn off rivals **(1)** • Increased levels of hormones leading to aggressive behaviours **(1)** • To demonstrate physical/biological fitness **(1)** • To demonstrate genetic/evolutionary fitness **(1)**	**1 mark for each reason, up to a maximum of 3 marks.** **Any other relevant answers.**	3
14	Describe **three** consequences of isolation within a fragmented landscape.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Less able to reach other populations/individuals **(1)** • Reduction in genetic health / Population becomes less heterogenous **(1)** • Greater risk of extinction **(1)** • Less robust against abiotic/biotic factors **(1)** **Possible example answer:** Less able to reach other populations/individuals – individual animals will find it hard to travel between distant populations to find a mate to reproduce. (1)	**Also accept:** • **disease could have a huge impact and wipe out population.** • **predator species could have a huge impact and severely decrease population.** **Any other relevant answers.**	3
15	A conservation charity has recently purchased an urban fringe woodland which has received no management for the past 20 years, including areas of previously coppiced broadleaves and semi mature conifers. Explain a range of management techniques that could be implemented at this site.		
	Acceptable answer(s)	**Guidance**	**Max mks**
	Indicative content **Management Techniques** • Reinstatement of a coppice rotation • Creation of rides/glades/edge habitats • Thinning of non-native softwoods • Removal/Felling of non-native softwoods • Planting/Replanting with broadleaves/native species • Creation/Retention of deadwood habitats	**Band 1: 1-4 Marks** A limited number of possible management techniques were put forward given the habitats stated with only a limited explanation/description given for each one demonstrating a limited knowledge of woodland management techniques.	12

	• Identify and preserve veteran trees • Creation of structural diversity • Management of herbivore population (e.g deer control/rabbits) • Undertake flora and fauna surveys • Scrub/Tree Management • Installation of bird boxes/bat boxes • Removal/management of invasive species • Also accept – management of people as urban fringe may have visitors; e.g. use of appropriate signage, fenced off areas to protect from visitors/trampling, car park facilities, way marked paths, use of volunteers to undertake management • Surveys to find out what management would be most appropriate	**Band 2 : 5-8 Marks** A wide range of possible management techniques were put forward given the habitats stated with good explanations/descriptions given demonstrating a good level of knowledge of woodland management techniques. **Band 3: 9-12 Marks** An extensive and imaginative range of possible management techniques were stated and explained in detail demonstrating a broad and in-depth knowledge of woodland management techniques.	