

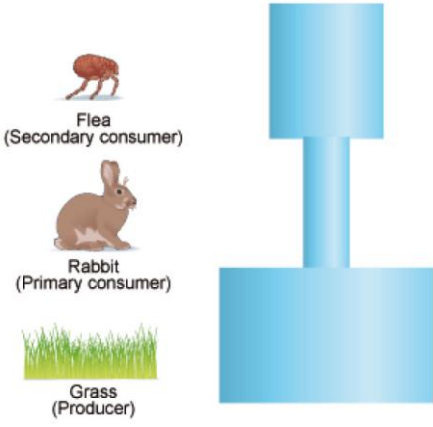
Qualification: 0173-509/009 Level 3 Technical in Land and Wildlife -

Theory Exam

June 2018

1a	State what type of rocks form through cooling and solidification of magma/lava.		
	Acceptable answer(s)	Guidance	Max mks
	Igneous Rocks (1)		1
1b	List the four basic components of soil.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each of the following, up to a maximum of 4 marks: <ul style="list-style-type: none"> • Mineral Matter/(Rock) (1) • Water (1) • Air (1) • Organic Matter (1)/Nutrients (1) 		4
2a	Describe the atomic structure of a water molecule.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each of the following, up to a maximum of 2 marks: <ul style="list-style-type: none"> • A water molecule (H₂O) is two hydrogen atoms and an oxygen atom (1) • covalently bonded (1) 		2

2b	Describe how the physical state of water is altered at a molecular level by increasing the temperature of liquid water beyond the boiling point.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each of the following, up to a maximum of 2 marks: <ul style="list-style-type: none"> • Heating liquid water will excite water molecules breaking hydrogen bonds/bonds between them (1) • Heating beyond the boiling point/100C will change water from its liquid state into a gaseous state (1) 		2
3a	Explain how energy moves through a food chain.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each of the following, up to a maximum of 7 marks: <ul style="list-style-type: none"> • Sun/Solar Radiation is the primary source of energy (1) • Solar energy captured/captured through photosynthesis by Primary Producers/ Plants / Other Autotrophic organisms) (1) • Photosynthesis converts light energy into usable chemical energy – glucose molecule produced (1) • Energy is transferred from plants to the primary consumers and from primary consumers (to the secondary consumers and upwards) OR Primary Consumers / heterotrophic organisms herbivores eat/ingest organic material and Secondary/Tertiary/Quaternary Consumers eat/ingest other organisms (1) • Each level in the food chain gets lesser energy because the energy is used up in each level to support life processes/growth and repair (1) • Energy is also lost back to the environment at each step/level in food chain - through heat loss (1) • Fungi and Bacteria/Decomposers/saprophytes harness energy by feeding on decaying/dead organic matter. (1) 	<i>Accept and award marks for any other acceptable answer.</i>	7

3b	<p>The population of each organism in a food chain can be shown in a sort of bar chart called a pyramid of numbers. The more organisms there are, the wider the bar.</p> <div style="text-align: center;">  </div> <p>Explain the pyramid of numbers in Figure 1 above.</p>		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 mark for each of the following, up to a maximum of 3 marks:</p> <p>The biomass / amount of grass is high, because a large proportion of grass is required to support a smaller numbers of Rabbit (1). Lots of fleas can feed on a rabbit (1) and hence a smaller number of rabbits will support a larger number of flea (1).</p>	Accept alternative wording for the response.	3
4	If a cold air mass descends, state what happens to the surface pressure.		
	Acceptable answer(s)	Guidance	Max mks
	It increases/An area of high pressure forms.		1
5a	With regards to the water cycle, state what is meant by a catchment.		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 of the following for 1 mark:</p> <ul style="list-style-type: none"> • A distinct area where rainfall collects (1) • An area usually surrounded by hills and mountains where water collects (1) • An area where water is collected by the natural landscape. (1) 	<i>Accept and award marks for any other acceptable answer.</i>	1

5b	Within the Carbon cycle, give three examples of how carbon is released to the atmosphere.		
	Acceptable answer(s)	Guidance	Max mks
	1 mark for each of the following, up to a maximum of 3 marks: <ul style="list-style-type: none"> • Released through respiration from plants and animals (1) • Released from volcanic eruptions (1) • Burning of fossil fuels (1) • Decomposition returns carbon to the atmosphere (1) • From ocean water (1) 	<i>Accept and award marks for any other acceptable answer.</i>	3
6a	State what is meant by a polyandrous mating system.		
	Acceptable answer(s)	Guidance	Max mks
	A polyandrous mating system which involves one female breeding with more than one male.		1
6b	State which life history strategy is typically favoured in unstable environments.		
	Acceptable answer(s)	Guidance	Max mks
	R-strategists		1
6c	Define the term Fecundity.		
	Acceptable answer(s)	Guidance	Max mks
	The actual reproductive rate of an organism/The reproductive rate discounting the environment.		1

6d	Give three reasons why monogamous relationships within the animal kingdom result in bi-parental care.		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 mark for each of the following, up to a maximum of 3 marks:</p> <ul style="list-style-type: none"> • Better able to protect offspring from harsh environment (1) • Better able to deter/fight off predators (1) • Able to collect more food/resources from the ecosystem for their young (1) • Able to share the burden of brooding/rearing (1) • Provides opportunities for adults to feed/resource themselves (1) • Each parent has an equal evolutionary interest/interest in the survival of their offspring (1) 	<i>Accept and award marks for any other acceptable answer.</i>	3
7	Explain how humans have caused habitat fragmentation and isolation.		
	Acceptable answer(s)	Guidance	Max mks
	<p>2 marks for 2 of the following, up to a maximum of 4 marks:</p> <ul style="list-style-type: none"> • Habitat Loss (1) through changes to land use for Agriculture, Forestry, Urban Development, Industry (1) • Infrastructure (Roads, Rail) (1) – barriers preventing movement (1) • Damage to habitat (1) due to Pollution, Recreation • Regeneration (1) – Lack of management leading to habitat change (1) 		4
8a	State when the Forestry Commission was formed.		
	Acceptable answer(s)	Guidance	Max mks
	a) 1919 – Establishment of the Forestry Commission	<i>Accept and award marks for any other appropriate answer.</i>	1

8b	Give one aim of the Forestry Commission.		
	Acceptable answer(s)	Guidance	Max mks
	1 of the following: <ul style="list-style-type: none"> To provide a strategic/home grown/sustainable source of timber To prevent home grown stocks of timber diminishing completely 	Alternative answers to include: Quality of life/ Economic stability/Sustainable management	1
9	During the Neolithic period, the original wildwood that covered the British Isles was significantly reduced. State the reason for this.		
	Acceptable answer(s)	Guidance	Max mks
	Woodland cleared away for agriculture/farming	<i>Accept and award marks for any other acceptable answer.</i>	1
10	Explain how coppicing was used to produce bronze and iron.		
	Acceptable answer(s)	Guidance	Max mks
	Answer to include the following up to 4 marks: <ul style="list-style-type: none"> Coppicing shrubs produces large amounts of small sized timber. (1) Areas/Coupes/blocks were cut on rotation to ensure a regular/annual supply of timber. (1) This timber was then part-burnt/dried/cooked in a charcoal kiln and converted into charcoal. (1) Charcoal when burnt generates high heat and was used to smelt iron and bronze. (1) 		4

11a	Name three types of information included on a woodland management plan.		
	Acceptable answer(s)	Guidance	Max mks
	<p>1 mark for any 3 of the following up to 3 marks:</p> <ul style="list-style-type: none"> • Site Information/Property Details (1) • Site Description (1) • Site Surveys (1) • Collation/Collection of Information/Information Search (1) • Site Evaluation (1) • Management Vision (1) • Management Aims (1) • Management Objectives (1) • Management Prescriptions (1) • Work Plan/Action Plan (1) 	<i>Accept and award marks for any other acceptable answer.</i>	3
11b	Explain how a woodland ride should be managed to create a good variety of habitats within it.		
	Acceptable answer(s)	Guidance	Max mks
	<p>2 marks for 2 of the following:</p> <p>Rotational cutting of grass and shrubs (1) will create different habitats/structures in the grassland/scrub habitats (1) Creation of 'V' shaped structure through thoughtful management (1) to create graded edges/ecotones (1) Creation of scallops/embayments (1) to create warm/sheltered areas (1) Rides should be sinuous/winding rather than straight (1) to reduce wind tunnelling and enhance structure (1) Retention of some large trees to reduce wind tunnelling (1) and to provide habitat and arboreal links (1)</p>		4

12	<p>You are a site ranger working for a local conservation charity. You manage a site that includes an extensive area of actively managed semi-natural coppice woodland on two hillsides. In the valley bottom there are extensive flood meadows and a seasonally fast flowing spate river.</p> <p>Downstream of the site, the local village has in the past had issues with flooding.</p> <p>Discuss how the woodland habitat and the management of them could help to alleviate the flood risk to the village by positively affecting the movement of water through the landscape.</p>		
	Acceptable answer(s)	Guidance	Max mks
	<p>Band 1: 1-4 Marks A limited discussion was produced explaining how the woodland habitat present on the site would help to alleviate flood risk. The learner demonstrated a basic level of scientific/technical knowledge and understanding in their discussion of the processes involved in the water cycle.</p> <p>Band 2 : 5-8 Marks A good discussion was produced explaining how the woodland habitat present on the site would help to alleviate flood risk. The learner demonstrated a good level of scientific/technical knowledge and understanding in their discussion of the processes involved in the water cycle.</p> <p>Band 3: 9-12 Marks An excellent discussion was produced with a detailed explanation of how the woodland habitat present on the site would help to alleviate flood risk. The learner demonstrated an excellent level of scientific/technical knowledge and understanding in their discussion of the processes involved in the water cycle.</p>	<p>Indicative content</p> <ul style="list-style-type: none"> • Relevant water cycle processes • Interception • Infiltration • Percolation • Through flow • Run off • Evapotranspiration • Soil stability • Water uptake (trees) • Reduce speed of movement of water through catchment • Planting of more trees • Preserve deadwood • Avoid soil disturbance 	12