Topic 2: The ecosystem

**2.1 Structure**

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|  | **Assessment statement** |
| 2.1.1 | Distinguish between biotic and abiotic (physical) components of an ecosystem. |
| 2.1.2 | Define the term *trophic level*. |
| 2.1.3 | Identify and explain trophic levels in food chains and food webs selected from the local  environment. |
| 2.1.4 | Explain the principles of pyramids of numbers, pyramids of biomass, and pyramids of productivity, and construct such pyramids from given data. |
| 2.1.5 | Discuss how the pyramid structure affects the functioning of an ecosystem. |
| 2.1.6 | Define the terms *species*, *population*, *habitat*, *niche*, *community* and *ecosystem* with reference to local examples. |
| 2.1.7 | Describe and explain population interactions using examples of named species. |

**2.2 Measuring abiotic components of the system**

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|  | **Assessment statement** |
| 2.2.1 | List the significant abiotic (physical) factors of an ecosystem. |
| 2.2.2 | Describe and evaluate methods for measuring at least three abiotic (physical) factors within an ecosystem. |

**2.3 Measuring biotic components of the system**

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|  | **Assessment statement** |
| 2.3.1 | Construct simple keys and use published keys for the identification of organisms. |
| 2.3.2 | Describe and evaluate methods for estimating abundance of organisms. |
| 2.3.3 | Describe and evaluate methods for estimating the biomass of trophic levels in a community |
| 2.3.4 | Define the term *diversity* |
| 2.3.5 | Apply Simpson’s diversity index and outline its significance. |

**2.4 Biomes**

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|  | **Assessment statement** |
| 2.4.1 | Define the term *biome* |
| 2.4.2 | Explain the distribution, structure and relative productivity of tropical  rainforests, deserts, tundra and any other biome. |

**2.5 Function**

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|  | **Assessment statement** |
| 2.5.1 | Explain the role of producers, consumers and decomposers in the ecosystem. |
| 2.5.2 | Describe photosynthesis and respiration in terms of inputs, outputs and energy  transformations |
| 2.5.3 | Describe and explain the transfer and transformation of energy as it flows through an ecosystem. |
| 2.5.4 | Describe and explain the transfer and transformation of materials as they cycle within an ecosystem |
| 2.5.5 | Define the terms *gross productivity*, *net productivity*, *primary productivity* and *secondary*  *productivity*. |
| 2.5.6 | Define the terms and calculate the values of both *gross primary productivity* (GPP) and *net primary productivity* (NPP) from given data. |
| 2.5.7 | Define the terms and calculate the values of both *gross secondary productivity* (GSP) and *net secondary productivity* (NSP) from given data |

**2.6 Changes**

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|  | **Assessment statement** |
| 2.6.1 | Explain the concepts of limiting factors and carrying capacity in the context of population growth. |
| 2.6.2 | Describe and explain S and J population curves. |
| 2.6.3 | Describe the role of density‑dependent and density‑independent factors, and  internal and external factors, in the regulation of populations. |
| 2.6.4 | Describe the principles associated with survivorship curves including, *K*‑ and *r*‑strategists. |
| 2.6.5 | Describe the concept and processes of succession in a named habitat. |
| 2.6.6 | Explain the changes in energy flow, gross and net productivity,  diversity and mineral cycling in different stages of succession. |
| 2.6.7 | Describe factors affecting the nature of climax communities. |

**2.7 Measuring changes in the system**

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|  | **Assessment statement** |
| 2.7.1 | Describe and evaluate methods for measuring changes in abiotic and  biotic components of an ecosystem along an environmental gradient |
| 2.7.2 | Describe and evaluate methods for measuring changes in abiotic and  biotic components of an ecosystem due to a specific human activity. |
| 2.7.3 | Describe and evaluate the use of environmental impact assessments (EIAs). |