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| outhern River College | **Year 12 Integrated Science**  **Abiotic and biotic Components of a marine ecosystem**  **Task 3: Extended Response (Validation)** |

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Marks:  **/22**

1. The clownfish and the sea anemone have a well-defined symbiotic relationship.

a) What type of symbiotic relationship is this? **(1 mark)**

MUTALISM

b) Explain your reasoning for part A. **(2 marks)**

SEA ANOEMONE PROVIDE A HARMLESS AND SAFE HABITAT

CLOWNFISH CLEAN/PROVIDE FOOD/PROTECTC

c) Describe one abiotic factor that impacts the ecosystem that these species coincide in. **(2 marks)**

LIGHT,DEPTH,TEMPERATURE

2. A large rainfall event has resulted in a large amount of water entering an estuarine ecosystem. As it is farming season this has meant that a large amount of fertilizer has been added to soils. This has resulted in a large amount of effluents such as Nitrogen stimulating the growth of algae.

a) What is the abiotic factor in this situation? **(1 mark)**

\_\_\_SOIL / NUTRIENTS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Explain the impact in which humans have upon the abiotic factor in this example. **(3 marks)**

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3. A team of biologists spent six months on an isolated island off the South-west coast of Australia. Their task was to prepare a biological survey of the estuary on the island. One of the biologists investigated the feeding relationships in the estuary. A brief summary of his findings is presented in the paragraph below.

*‘Small fish and shrimp have been observed eating seagrass in the offshore ecosystem in South West Western Australia. Small fish also consume zooplankton and algae, whereas shrimp also eat dead remains. Phytoplankton is the diet of zooplankton. Octopus and squid are observed eating shrimp and small fish with urchins observed only consuming algae. Jellyfish is considered the predator of zooplankton and phytoplankton, which pink snapper is the only consumer of jellyfish. Pink snapper also eats squid, octopus, small fish and sea urchins. Dhufish is the other large fish observed which eats squid, octopus and small fish. Seals and sharks consume both types of large fish (dhufish and pink snapper).*

a) Draw a food web of the information in the space provided below **(8 marks)**

b) For each different trophic level in the food web colour code the organisms that belong to it (ie. Producers in green, first order consumers blue, second order consumers red etc.) **(5 marks)**

1. 1 mark all organisms are included + 1 mark all trophic levels identified + 5 marks all consumer relationships correctly identified + 1 mark all arrows go from food to consumer
2. 1 mark legend of tropic level colours + 1 mark for correctly identifying each tropic level (max 4 marks)

Producers: phytoplankton, algae, sea grass

Primary consumers: small fish, shrimp, sea urchins, zooplankton

Secondary consumers: octopus, jellyfish, squid

Tertiary/Top order consumers: Dhufish, snapper, seals, sharks