MARKING SCHEME

MARINE TECHNOLOGY GRADE: 10

SECTION A (30 MARKS)

1.

(a) (i) Name: Mangrove Swamp / Mangrove Forest. (1mk)

(ii) Characteristic: Presence of stilt roots / salt-tolerant trees / muddy anaerobic soil. (1mk)

(b) (i) Name: Coral Reef. (1mk)

(ii) Characteristic: Clear, warm, shallow water / High calcium carbonate structures / High biodiversity. (1mk)

(c) (i) Name: Estuary.

(ii) Characteristic: Brackish water (mixture of salt and fresh) / High nutrient levels / Fluctuating tides. (1mk)

2.

(a) P: Operculum (Gill cover). (1mk)

(b) Q: Lateral Line. (1mk)

(c) R: Dorsal Fin. (1mk)

(d) S: Pectoral Fin. (1mk)

(e) Function of T (Caudal Fin): To provide propulsion / thrust / push the fish forward through the water. (1mk)

3.

(a) — (iii)

(b) — (iv)

(c) — (ii)

(d) — (i)

(e) — (v) *(1 mark each)*

4. True or False (5 Marks)

(a) **FALSE** (It is a chemical characteristic).

(b) **FALSE** (Lake Turkana is saline/alkaline).

(c) **FALSE** (Sharks lack a swim bladder).

(d) **TRUE**.

(e) **FALSE** (It was introduced into Lake Victoria). *(1 mark each)*

5. Definitions and Short Listing (10 Marks)

(a) Aquaculture: The farming of aquatic organisms, including fish, mollusks, crustaceans, and aquatic plants in controlled environments. (2mks)

(b) Site Selection Factors: (3mks)

Soil type (Clay content).

Topography (Gentle slope).

Water availability and quality.

(c) Internal Parts: (2mks)

Gills.

Swim bladder.

(d) Distinguish: Extensive systems rely on natural food and have low stocking densities with minimal management, whereas Intensive systems involve high stocking densities, artificial feeding, and mechanical aeration/management. (3mks)

SECTION B (50 MARKS)

6.

(a) Importance: Topography determines the ease of filling and draining the pond by gravity. Soil type (clay) is critical to prevent water seepage/leaking through the pond bottom. (4mks)

(b) Steps: (6mks)

Clear the site of vegetation.

Mark out the area (set out).

Dig/excavate the pond.

Construct the dykes (walls).

Line the pond (using polythene/geomembrane).

Install inlet and outlet systems.

(c) Calculation: $25m \times 10m = 250m^2$. (2mks)

(d) Security: Fencing, hiring guards, installing lighting, or using alarm systems. (3mks)

7.

(a) Process: Acclimatization. (1mk)

(b) Why: To equalize the temperature between the transport water and the pond water to prevent thermal shock/death of fingerlings. (3mks)

(c) Practice: Fertilization. (1mk) **Purpose:** To stimulate the growth of phytoplankton (natural food). (2mks)

(d) Record Keeping: Monitoring growth rates, tracking feed costs, and assessing profitability/detecting disease early. (3mks)

(e) Liming: To neutralize soil acidity and kill parasites/pathogens in the pond bottom. (2mks)

(f) Equipment: (i) Gloves, (ii) Respirator/Mask, (iii) Overalls. (3mks)

8.

- **(a) Factors:** Rising sea temperatures (global warming) and ocean acidification/pollution. (4mks)
- **(b) Benefits:** Tourism income, sustainable fish supply for food/sale, and coastal protection from storms. (3mks)
- **(c) Conservation:** Reforestation of mangroves, banning destructive fishing gears (e.g., beach seines), and creating Marine Protected Areas (MPAs). (3mks)

9.

(a) Skeletal Difference: Bony fish (Tilapia) have a bone skeleton; Cartilaginous fish (Shark) have a cartilage skeleton. (2mks)

(b) Comparison: Bony fish have gills covered by an operculum; Cartilaginous fish have external gill slits without a cover. (4mks)

(c) Organ: Swim bladder. (2mks)

(d) Hazards: Sharp tools (cuts), slippery floors (falls), or exposure to extreme cold in freezers. (2mks)