Maritime Technology and Nature

Maritime Technology · Answer Key · 8 Questions

1. Which bio-inspired design feature, often found on modern ship hulls, mimics the tubercles on a humpback whale's flipper to improve hydrodynamic efficiency?

A) Vortex generators
B) Active fins
C) Curved bow bulbs
D) Friction-reducing paint

2. What is the primary environmental purpose of using 'scrubber' technology on large commercial vessels?

A) To prevent whale strikes
B) To reduce sulfur oxide emissions
C) To track migratory patterns
D) To collect floating microplastics

3. The study of 'biomimetics' in maritime technology led to the development of sharkskin-textured hull coatings. What is the intended function of this texture?

A) To glow in the dark for safety
B) To increase top speed
C) To reduce biofouling and drag
D) To improve sonar stealth

4. Which piece of maritime monitoring technology uses acoustic sensors to help ships avoid collisions with large marine mammals?

A) Passive Acoustic Monitoring (PAM)
B) Thermal imaging arrays
C) GPS drift buoys
D) Satellite altimetry

5. What is the primary function of 'ballast water treatment systems' required by international maritime regulations?

A) To desalinate seawater for crew
B) To prevent the spread of invasive aquatic species
C) To increase ship buoyancy in storms
D) To cool the engine core

6. Ship-quieting technology, designed to reduce underwater radiated noise, is primarily intended to protect which environmental aspect?

A) The integrity of the ship's keel

B) The communication and foraging of cetaceans

C) The temperature of the deep ocean

D) The clarity of sonar navigation

7. Which type of propulsion technology utilizes wind energy via rigid wing sails, drawing inspiration from the flight mechanics of birds?

A) Flettner rotors

B) Turbosails

C) Hydro-jet propulsion

D) Steam turbines

8. What environmental hazard do 'propeller boss cap fins' (PBCF) help mitigate by optimizing water flow around the propeller hub?

A) Cavitation-related energy loss and underwater noise

B) Oil leakage into the ocean

C) The accumulation of plastic waste

D) Overheating of the propeller shaft