

Maritime Technology Fundamentals

Maritime Technology · Answer Key · 18 Questions

1. Which of the following principles primarily governs the lift force experienced by a hydrofoil?

- A) Newton's third law of motion (action-reaction)
- B) Bernoulli's principle of fluid dynamics**
- C) Archimedes' principle of buoyancy
- D) Pascal's principle of hydrostatic pressure

2. What is the primary function of a sonar system in maritime applications?

- A) To measure atmospheric pressure
- B) To detect and locate underwater objects using sound waves**
- C) To transmit navigational signals over long distances
- D) To monitor the salinity of seawater

3. The concept of 'metacentric height' is critical in naval architecture for determining what characteristic of a vessel?

- A) Maximum speed
- B) Fuel efficiency
- C) Initial stability**
- D) Cargo capacity

4. What type of propulsion system utilizes a rotating blade assembly within a cylindrical housing to generate thrust, often found on modern tugs and ferries?

- A) Paddlewheel
- B) Steam turbine
- C) Waterjet**
- D) Propeller shaft

5. The 'hull' of a ship is primarily designed to achieve what fundamental purpose?

- A) House the main engines
- B) Provide buoyancy and structural integrity to float on water**
- C) House crew accommodations
- D) Store cargo and provisions

6. Which navigational system relies on a constellation of satellites to determine a vessel's precise position on Earth?

- A) LORAN (Long Range Navigation)
- B) Inertial Navigation System (INS)
- C) Radar (Radio Detection and Ranging)
- D) GPS (Global Positioning System)**

7. What is the primary advantage of using composite materials (e.g., fiberglass, carbon fiber) in modern boat construction?

- A) Lower manufacturing cost
- B) Higher density
- C) Increased strength-to-weight ratio**
- D) Greater susceptibility to corrosion

8. The phenomenon of 'cavitation' in marine propellers occurs when:

- A) The propeller blades corrode due to saltwater
- B) The local pressure drops below the vapor pressure of the water, forming bubbles**
- C) The propeller speed exceeds the speed of sound in water
- D) The propeller becomes entangled with debris

9. What is the principal scientific basis behind the operation of a marine radar system?

- A) Reflection of sound waves
- B) Emission of light pulses
- C) Transmission and reception of radio waves**
- D) Detection of magnetic field variations

10. A 'bulbous bow' is a common feature on large ships. Its primary function is to:

- A) Increase cargo storage space
- B) Reduce wave-making resistance and improve fuel efficiency**
- C) Provide a mounting point for the anchor
- D) Act as a protective barrier against ice

11. What is the fundamental principle that allows a submarine to submerge and surface?

- A) Changing the volume of water displaced**
- B) Adjusting the density of the submarine's hull
- C) Utilizing propeller thrust to overcome buoyancy
- D) Increasing the external water pressure

12. The 'International Maritime Organization' (IMO) sets global standards for what aspect of maritime operations?

- A) Crew wages
- B) Ship financing
- C) Maritime safety, security, and environmental protection**
- D) Port logistics

13. What type of engine is most commonly used for propulsion in large commercial vessels due to its high torque and fuel efficiency at low RPMs?

- A) Gas turbine
- B) Reciprocating diesel engine**
- C) Electric motor
- D) Rotary engine (Wankel)

14. The 'International System of Units' (SI) unit of force, commonly used to describe thrust and drag in maritime contexts, is the:

- A) Joule
- B) Watt
- C) Pascal
- D) Newton**

15. What is the primary purpose of a 'stabilizer fin' on a ship?

- A) To increase speed
- B) To reduce rolling motion in waves**
- C) To improve maneuverability
- D) To assist in docking

16. The term 'displacement hull' refers to a type of hull design that:

- A) Rides on top of the water
- B) Moves through the water by pushing it aside**
- C) Utilizes wing-like structures for lift
- D) Is designed for high speeds only

17. What material is traditionally used for ship hulls due to its strength, durability, and relative ease of repair, though susceptible to corrosion?

- A) Aluminum alloy
- B) Titanium
- C) Steel**
- D) Wood

18. The 'AIS' (Automatic Identification System) is a tracking system used on ships primarily for what purpose?

- A) Monitoring engine performance
- B) Detecting underwater mines
- C) Collision avoidance and vessel traffic services**
- D) Measuring water depth