

SMS-303: Integrative marine sciences, physics.

Quiz Lab 4.

1. Resonance

- a. is the principle whereby we use reasoning to study science.**
- b. is a concept from acoustics linking different waves.**
- c. is what happens when wind piles water on one side of a lake.**
- d. occurs when we force a system at its natural frequency.**

2. Neutrally buoyant particles in surface gravity wave:

- a. Have circular trajectory.**
- b. Have smaller trajectories at depth compared to near the surface.**
- c. Do not, on average, move with the speed of the wave.**
- d. All of the above.**

3. Group and phase speeds of waves:

- a. always have the same value.**
- b. can have the same value.**
- c. never have the same value.**
- d. None of the above.**

4. Deep water waves:

- a. are waves with small wavelengths compared to the depth of the fluid.**
- b. tsunami are deep water waves.**
- c. all propagate at the same speed.**
- d. are waves of large amplitude.**

5. Wave energy:

- a. propagates with the group speed.**
- b. is proportional to the square of the amplitude of the wave.**
- c. can be both potential and kinetic.**
- d. all of the above.**

6. A seich:

- a. is the same for basins of variable depths but the same horizontal size.**
- b. refers to water oscillation in a basin at the natural frequency of the basin (lake, bay).**
- c. replaces water from one side of the lake with that of the other.**
- d. all of the above.**

7. Doppler shift:

- a. refers to a change in the perceived frequency of a wave due to the relative motion of the receiver and/or the wave source.**
- b. depends on hearing device.**
- c. changes the frequency of a wave to a higher frequency.**
- d. all of the above.**

8. Hull speed:

- a. relates the speed of a boat or an animal riding on the surface of water to that of gravity waves having the same length.**
- b. explains why longer boat can go faster.**
- c. both a and b.**
- d. is a function of viscosity.**

9. Refraction occurs when:

- a. When a wave front encounter a medium where it has a different wave speed.**
- b. The wave gets steeper.**
- c. When the ratio of amplitude to wavelength is $1/7$.**
- d. When a wave encounter a bluff.**

10. Shallow water waves:

- a. are waves with small wavelengths compared to the depth of the fluid.**
- b. tsunami are shallow water waves.**
- c. suffer dispersion.**
- d. all of the above.**