QUIZ SET C: Oceanography 101

Check the Course Syllabus for the DUE DATE of this quiz set.

Come to class on the due date with a SCANTRON filled in with your answers. You must submit a SCANTRON to receive credit, not a printout with boxes checked.

This Quiz Set covers Chapter 8, Chapter 9, Chapter 10 and Chapter 12 in the Essentials of Oceanography textbook (8th edition by Trujillo & Thurman). I encourage you to print out the quiz and work on it as you read each chapter. There are 48 questions, 12 for each chapter. The questions are in random order; that is, not the order the topics are covered in each chapter.

Chapter 8

1. A storm far out at sea has made waves of many different wavelengths. As these waves move away from the storm area
   (a) they will slow down, since the storm wind is no longer there to push them along.
   (b) the short wavelength waves will overtake and pass the long wavelength waves.
   (c) the wave trains will move at twice the speed of the waves themselves.
   (d) the waves will be bent into curving paths by the Coriolis effect.
   (e) the waves will separate out into uniform, symmetrical groups of waves called swells.

2. Compare Figure 8.10 with Figure 8.26 (and be sure you can tell what each figure is showing). Which of the following is a CORRECT conclusion that you could make from these figures?
   (a) The largest waves occur in the North Pacific, where the largest storms are.
   (b) The east coasts of continents tend to have higher waves than the west coasts.
   (c) The greatest potential for wave energy exists in countries along the belt of prevailing westerlies in the southern Hemisphere.
   (d) You would get more wave energy from a LIMPET 500 plant if you put it on Hawaii than if you put it on New Zealand.
   (e) None of the above are correct.

3. Waves at the ocean surface are examples of _______________ waves, because ________________.
   (a) transverse waves ... because the water moves up-and-down as the waves pass by.
   (b) orbital waves ... the water moves in a circle or ellipse as the waves pass by
   (c) longitudinal waves ... the water is compressed, like the air is compressed by a sound wave
   (d) internal waves ... the water moves at the boundary between the water and the air
   (e) None of the above.
4. Which of the following is CORRECT regarding the speed of waves? (Hint: check Figure 8.7)

(a) A wave will generally speed up as it comes into shallow water.
(b) The longer the wavelength, the faster the wave.
(c) A transitional wave will travel faster than a deep-water wave.
(d) A short period wave will be faster than a long period wave.
(e) A wind wave will be faster than a tsunami.

5. Which of the following is/are CORRECT regarding a tsunami?

(a) Either the crest or the trough of a tsunami may arrive at the shoreline first.
(b) A typical tsunami is a rapidly rising rush of water onto land, not a down-crashing wave.
(c) Most destructive tsunami occur in the Atlantic Ocean, and the main tsunami warning system is located in the Atlantic too.
(d) Both (a) and (b) above are correct.
(e) Both (b) and (c) above are correct.

6. Imagine a wave with a 300 foot wavelength approaching the shore. At what water depth will water motion of the wave begin to touch the sea floor? (In other words, what is the wave base for this wave?)

(a) 600 feet.
(b) 300 feet.
(c) 150 feet
(d) 50 feet.
(e) Can't tell without more information.

7. What do "rogue waves" and "surf beat" have in common?

(a) They both have regular, predictable occurrences.
(b) They both occur far from shore.
(c) They both are products of wave interference.
(d) They both behave like deep-water waves.
(e) These are two different terms for the same thing.

8. A tsunami could be caused by

(a) storms far out at sea.
(b) undersea volcanic eruptions, fault movements, or landslides.
(c) a seismic sea wave.
(d) constructive interference of several smaller waves to make a very large wave.
(e) the prevailing westerly winds.
9. **Internal waves are most closely associated with**
   (a) tropical cyclones.
   (b) undersea earthquakes.
   (c) the pycnocline.
   (d) shallow water.
   (e) constructive interference.

10. **As waves out at sea come into shallow water near shore**
    (a) the wavelength decreases.
    (b) the waves slow down.
    (c) the wave height increases.
    (d) the waves break when their height:length ratio gets larger than 1:7.
    (e) All of the above.

11. **Tsunamis are very long waves, with wavelengths that often exceed 100 miles. In contrast, the average depth of the oceans is a little more than 2 miles. Therefore, tsunamis are best classified as**
    (a) deep-water waves.
    (b) transitional waves.
    (c) shallow-water waves.
    (d) internal waves.
    (e) capillary waves.

12. **Waves coming in toward the shore tend to bend and become more parallel to the shore as a result of**
    (a) constructive interference.
    (b) destructive interference.
    (c) diffraction.
    (d) refraction.
    (e) reflection.
Chapter 9

13. Which of the following represents the main disadvantage of generating electricity from the tides?
   (a) Tides are too powerful to be used for electrical power generation, although people have tried.
   (b) The lunar day is not equal to the solar day.
   (c) Spring tides are not equal to neap tides.
   (d) Tides are reversing currents, but electrical turbines can spin in only one direction.
   (e) There are less than ten places on earth where tidal ranges are great enough to generate electricity effectively.

14. Which of the following would you expect to see in the Bay of Fundy?
   (a) powerful ebb currents
   (b) the world's largest tidal range
   (c) whirlpools
   (d) (a), (b) and (c) above.
   (e) None of the above.

15. The imbalance (unequality) of the moon's gravitational force versus the centripital force created by the orbit of the earth and moon around each other
   (a) causes all the ocean water to flow to the side of the earth away from the Moon.
   (b) causes spring tides on one side of the earth and neap tides on the other at the same time.
   (c) causes amphidromic tides.
   (d) causes two tidal bulges; one at the North Pole and one at the South Pole.
   (e) causes two tidal bulges; one facing the Moon, and one on the opposite side of the earth from the Moon.

16. A tidal bore is
   (a) a tide that just talks about itself and never shuts up.
   (b) the rotary movement of a tidal wave around an amphidromic point.
   (c) a special type of tidal surge that occurs only in certain areas of Scandinavia.
   (d) a tidal process most likely to be seen during the first quarter and third quarter phases of the moon.
   (e) a wave caused by an incoming tide moving up a river.
17. An amphidromic point is
(a) a place where the tides start each tidal day.
(b) a place where the tides stop each tidal day.
(c) a point in the ocean around which the tidal wave rotates, and where there is little or no tidal range.
(d) a place where the tidal range (the vertical sea surface change from high tide to low tide) is greatest.
(e) the breaking crest of a tidal bore.

18. Tides are caused by the earth rotating under tidal bulges. Therefore, if a place on one side of the earth is having a high tide, a place on the exact opposite side of the earth will likely have ______________ at the same time.
(a) a semidiurnal tide
(b) a neap tide
(c) a low tide
(d) a high tide
(e) a mixed tide

19. The main force that causes ocean tides is
(a) the rotation of the earth.
(b) water displaced by underwater earthquakes and landslides.
(c) Ekman Transport and the Coriolis effect.
(d) the gravity of the Sun and the Moon.
(e) the trade winds.

20. When the Sun, Moon, and Earth are all in line,
(a) the overall gravitational attraction on the oceans will be less.
(b) the arrival of the high tide will be delayed.
(c) the arrival of both the high and low tides will be sped up.
(d) there will be little difference between high tide and low tide.
(e) the highest high and lowest low tides will occur.
21. The greatest tidal ranges will occur when the Moon is at _______ and the Earth is at _______.
(a) perigee ... perihelion
(b) perigee ... aphelion
(c) apogee ... perihelion
(d) apogee ... aphelion
(e) aphelion ... apogee

22. The tides along the coast of California are __________ tides, whereas the tides along the east coast of the US are __________ tides. (Hint: check out Figure 9.15.)
(a) semidiurnal tides ... diurnal tides
(b) diurnal tides ... mixed tides
(c) mixed tides ... semidiurnal tides
(d) flood tides ... ebb tides
(e) lunar tides ... solar tides

23. Which phase of the Moon would have the smallest tidal range?
(a) Crescent Moon
(b) New Moon
(c) Full Moon
(d) Quarter Moon
(e) Gibbous Moon

24. A tidal pattern with two nearly equal high tides and two nearly equal low tides per lunar day is called
(a) diurnal.
(b) quasidiurnal.
(c) semidiurnal.
(d) metrodiurnal.
(e) mixed.
Chapter 10

25. What happens to the sand at the end of a typical beach compartment?
(a) The sand flows down a submarine canyon.
(b) The sand piles up at a river delta.
(c) The sand accumulates in longshore bars offshore of the beach.
(d) The sand forms a large sand spit.
(e) The sand forms a tombolo.

26. What do the beaches of both the US east coast and US west coast have in common?
(a) Both coasts have abundant barrier islands.
(b) The longshore current and longshore drift on both coasts generally goes from north to south.
(c) Both coasts are rising, and so are dominated by emergent shoreline features.
(d) Both coasts are sinking, and so are dominated by submergent shoreline features.
(e) None of the above.

27. Human activities that have contributed to shoreline erosion include
(a) construction of jetties and groins along beaches.
(b) construction of seawalls along beaches.
(c) construction of dams on rivers.
(d) (a), (b) and (c) above.
(e) None of the above.

28. Which of the regions of the beach system listed would be the farthest from the beach?
(a) backshore
(b) berm
(c) beach face
(d) foreshore
(e) longshore bar
29. Which of the following is the most accurate statement about sea level changes today?
(a) Sea level is presently rising by about 2 inches per year.
(b) Sea level is presently rising by about 0.1 inch per year.
(c) Sea level is presently stable, although it has varied a lot in the past.
(d) Sea level is presently going down by about 1 inch per year.
(e) In the previous century sea level was slowly going down, but today it is slowly rising.

30. Which of the following is true of barrier islands along the coasts of the US?
(a) They are more common on the west coast than the east coast.
(b) They migrate landward with rising sea level.
(c) You will commonly find peat deposits on the ocean-facing sides of barrier islands.
(d) (a) and (b) above.
(e) (b) and (c) above.

31. Along the Pacific Coast of the US, heavy wave activity (large, high-energy waves) is more common in winter than in summer. Therefore, which of the following is correct about Pacific Coast beaches in winter?
(a) Both the berms and the longshore bars are large.
(b) The berms are large and well-developed, but the longshore bars are small.
(c) The berms are small, but the longshore bars are large.
(d) Both the berms and the longshore bars are small.
(e) Cannot make any such generalization.

32. Because dams on rivers have in many cases lead to ____________________, people have turned to ___________________ to help restore eroded beaches.
(a) beach starvation ... beach replenishment
(b) beach progression ... beach regression
(c) salinization ... breakwaters
(d) delta formation ... dredging
(e) relocation ... hard stabilization
33. Worldwide (eustatic) changes in sea level can be caused by
(a) changes in the sizes of glaciers and ice caps.
(b) changes in rates of sea floor spreading.
(c) changes in ocean temperature.
(d) (a), (b) and (c) above.
(e) None of the above.

34. Rip currents flow __________________, and if you are caught in one, you should
__________________.
(a) parallel to shore ... float with the current until it dies out
(b) parallel to shore ... swim toward shore to get back to the beach
(c) away from shore ... float with the current, because it will eventually curve back toward the beach
(d) away from shore ... swim hard against the current, because most people can swim faster than a rip current
(e) away from shore ... swim parallel to shore to get out of the current

35. Which of the following best describes longshore drift?
(a) The net movement of sand toward the beach when the waves are small.
(b) The net movement of sand away from the beach when the waves are large.
(c) The net movement of sand along the beach in the direction the waves are going.
(d) The net movement of sand along the beach opposite the direction the waves are going.
(e) None of the above.

36. The Cape Hatteras Lighthouse (North Carolina) is a good example of dealing with coastal erosion by
(a) beach compartmentalization.
(b) seawall construction.
(c) hard stabilization.
(d) relocation.
(e) beach replenishment.
Chapter 12

37. The scientific name of the domestic dog is "Canis familiaris". (Aside: although there are many types of dogs, they can all interbreed with one another; thus they all belong to a single species.) In scientific classification, "Canis" is the _________, and "familiaris" is the _________.

(a) kingdom ... phylum
(b) genus ... species
(c) species ... genus
(d) class ... order
(e) family ... genus

38. What features characterize the oxygen minimum layer?

(a) Abundant sunlight and photosynthesis.
(b) Low amounts of oxygen.
(c) High levels of nutrients.
(d) (a) and (b) above.
(e) (b) and (c) above.

39. Figure 12.8 shows us that the smaller an object, the relatively larger its surface area compared to its volume. This principle gives tiny phytoplankton cells the ability to do what?

(a) Increase the efficiency with which they transfer nutrients and waste across their cell membranes.
(b) Reduce the rate at which they sink through the water.
(c) Swim more easily, since their small size makes them less resistant to water's viscosity.
(d) (a) and (b) above.
(e) (b) and (c) above.

40. Marine fishes are ______________ compared to the surrounding seawater, and therefore have adaptations to deal with the problem of ________________. (Hint: The question concerns osmosis.)

(a) hypotonic ... losing water from their bodies
(b) hypotonic ... absorbing excess water into their bodies
(c) hypertonic ... losing water from their bodies
(d) hypertonic ... absorbing excess water into their bodies
(e) lonely ... finding a party
41. Figure 12.11 illustrates the striking difference between land and ocean temperature ranges. This difference is caused by
(a) the greater heat capacity of water versus land.
(b) the fact that some solar energy goes into evaporating ocean water rather than increasing its temperature.
(c) the fact that solar energy penetrates much farther into ocean water than it does into rock and soil.
(d) (a), (b) and (c) above.
(e) None of the above.

42. What do phytoplankton and zooplankton have in common?
(a) They can both produce their own food through photosynthesis.
(b) Neither can produce their own food through photosynthesis.
(c) They both belong in the Kingdom Protocista.
(d) They both belong in the Domain Archaea.
(e) They both float and drift with ocean currents.

43. Which of the following oceanic zones would probably have the FEWEST bioluminescent organisms?
(a) mesopelagic
(b) bathypelagic
(c) abyssopelagic
(d) hadal
(e) euphotic

44. Animals that are classified as infauna or epifauna might be found in any of the following areas EXCEPT
(a) littoral zone
(b) mesopelagic zone
(c) bathyal zone
(d) abyssal zone
(e) hadal zone
45. Which of the following statements about marine life is INCORRECT?
(a) Countershading describes a common color pattern in fishes with dark coloration on the top of the body and light coloration on the bottom.
(b) The deep scattering layer occurs closest to the surface in the middle of the night.
(c) The increasing pressure with depth is one of the greatest difficulties faced by marine organisms.
(d) In general, warm water species grow faster and have shorter life spans than cold water species.
(e) Photosynthesis occurs in the euphotic zone.

46. Which of the following kingdoms of organisms lacks a cell nucleus?
(a) Monera
(b) Protoctista
(c) Fungi
(d) Plantae
(e) Animalia

47. Organisms that are plankton during their juvenile stage, but become nekton or benthos in their adult stage are called
(a) picoplankton.
(b) meroplankton.
(c) macroplankton.
(d) ultraplankton.
(e) holoplankton.

48. Which of the following creatures would NOT be classified as nekton?
(a) tuna
(b) jellyfish
(c) a surfer paddling out through the waves
(d) dolphin
(e) squid

END OF QUIZ SET C!