

Final Exam

Started: Dec 10 at 5:48am

Quiz Instructions

BIO 22 Final Exam

The final exam consists of a combination of 4 essay questions, 56 multiple choice questions, and 2 numerical calculations. Although the focus of this exam is Modules 4 - 6, it is cumulative and will include some questions from past modules, chapters, and video lectures covered during the whole semester.

Once you start the exam, you will have a maximum of 5 (five) hours to complete it. The exam must be completed and submitted by 6:00 PM on the due date (so if you start taking the exam after 1 PM of the day on which the exam is due, then you will have less than 5 hours).

Question 1

2 pts

Consider the following scenario: you take a sample of pure, filtered seawater at 35 ppt salinity and using a lab scale you measure its mass: it weighs 1 kg (=1,000g).

You put your sample over a boiler and evaporate the water completely so that all you have left in the container are the salts that were previously dissolved in the seawater.

Here is the question: How many grams of total salt residue would you get after you evaporate all the water out of the container? (round your answer up so that there are no decimals)

Question 2

1 pts

Where do tropical cyclones form?

- ☐ Within a single cool and dry air mass
- ☐ Between air masses
- ☐ Within a single warm and humid air mass
- ☐ High pressure systems

Question 3**1 pts**

What occurs when air is subjected to less pressure?

- ☐ The water vapor is able to condense.
- ☐ The air becomes compressed.
- ☐ The air becomes warmer
- ☐ The air expands and rises

Question 4**1 pts**

If a ship is trying to sail from the eastern United States to Europe, what route would be the most efficient to take?

- ☐ A southern route to take advantage of the easterlies
- ☐ A northern route to take advantage of the easterlies
- ☐ A southern route to take advantage of the westerlies
- ☐ A northern route to take advantage of the westerlies

Question 5**1 pts**

An area is found to have a high rate of erosion (like the base of a rapidly eroding shore cliff). What kind of sediment is likely to be in the surrounding waters?

- ☐ Poorly sorted sediments
- ☐ Well-sorted sediments
- ☐ One size of sediment
- ☐ No sediments would be found in such an area

Question 6**1 pts**

_____ are likely to be found in subduction zones.

- ☐ Mid-ocean ridges
- ☐ Trenches
- ☐ Submarine canyons
- ☐ Abyssal hills

Question 7**1 pts**

What characteristic is associated with convergent plate boundaries?

- ☐ Spreading zones
- ☐ Violent geological activity
- ☐ Solidification of crust materials
- ☐ New crust formation

Question 8**1 pts**

The sustained heat within the Earth's interior is attributed to:

- ☐ Conduction
- ☐ Convection
- ☐ Radioactive decay
- ☐ Isostatic equilibrium
- ☐ The Sun

Question 9**1 pts**

When two oceanic plates converge what determines which crust will submerge?

- ☐ The density of the crust
- ☐ The age of the crust
- ☐ All of these are correct
- ☐ The temperature of the crust

Question 10**1 pts**

Which of these was formed by a hotspot?

- ☐ the Himalaya Mountains
- ☐ The Hawaiian Islands
- ☐ the Gulf of California

- ☐ The Marianas Trench

Question 11**1 pts**

What was the key factor for the initial development of life on Earth?

- ☐ Simple sugars
- ☐ Exposure to sunlight
- ☐ Energization from comet and meteor impacts
- ☐ Absence of free oxygen

Question 12**1 pts**

How do seasons affect the Intertropical Convergence Zone (ITCZ)?

- ☐ During the northern summer, it shifts to the south.
- ☐ Seasons do not affect it
- ☐ During the northern winter, it shifts to the north.
- ☐ During the northern winter, it shifts to the south.

Question 13**1 pts**

Why is biosynthesis unlikely to occur today as it did when the Earth was young?

- ☐ There is less available oxygen in the atmosphere

- ☐ Ozone is less protective from the sun's influence
- ☐ Living organisms have altered oceanic and atmospheric conditions
- ☐ There are no more asteroid or meteor impacts to "seed" the earth

Question 14**1 pts**

In iron deficient regions, adding iron to the oceans might reduce global warming by:

- ☐ increasing photosynthetic use of oxygen.
- ☐ increasing photosynthetic production of oxygen.
- ☐ increasing photosynthetic use of carbon dioxide.
- ☐ increasing photosynthetic production of carbon dioxide.

Question 15**1 pts**

What type of margin is generally steep?

- ☐ Continental margin
- ☐ Passive margin
- ☐ Shelf break
- ☐ Active margin

Question 16**1 pts**

Where can the *youngest* oceanic crust be found?

- ☐ midway between oceanic ridges and continental margins
- ☐ at the very edge of the continents
- ☐ deep within subduction zones
- ☐ at oceanic ridges

Question 17**1 pts**

What is a main source of terrigenous sediments?

- ☐ Dead plants and animals
- ☐ Volcanic eruptions
- ☐ Rivers
- ☐ Dust and ash

Question 18**1 pts**

Why are fisheries in the west coast of South America so heavily impacted by El Nino/ ENSO events?

- ☐ Because upwelling completely ceases in all the Pacific Basin
- ☐ The northward flow of the nutrient-rich Peru current is interrupted when the trade winds shift
- ☐ Low pressure systems create downwelling events rather than the normal upwelling
- ☐ Rise in sea level affects migration patterns

Question 19**1 pts**

The Gulf Stream and North Atlantic Current

- ☐ move heat southward toward the equator
- ☐ move heat toward England, Scotland, and Ireland
- ☐ the northward flow of the Gulf Stream
- ☐ keep the east coast of the US cool and dry in the summer
- ☐ gives up all of its heat when warm water eddies are formed

Question 20

1 pts

What is NOT a characteristic of western boundary currents?

- ☐ They are deep currents.
- ☐ They are broad currents.
- ☐ They move warm water poleward.
- ☐ They are fast moving currents.

Question 21

1 pts

What is responsible for the long thin band of biological productivity along the equator?

- ☐ Thermohaline circulation
- ☐ Coastal upwelling wedged between gyres
- ☐ Wind induced downwelling
- ☐ Equatorial upwelling
- ☐ Langmuir Circulation

Question 22**1 pts**

When does a wave begin to interact with its bottom?

- ☐ When the bottom is deeper than twice the wavelength
- ☐ When the bottom is shallower than $\frac{1}{2}$ the wavelength
- ☐ When the bottom is deeper than $\frac{1}{2}$ the wavelength
- ☐ When the bottom is shallower than twice the wavelength

Question 23**1 pts**

What is a characteristic of a tsunami?

- ☐ Long wavelengths
- ☐ Deep-water waves
- ☐ Standing waves in the open ocean
- ☐ Short wavelengths

Question 24**2 pts**

Calculate the speed (in meters per second) of a tsunami in the Pacific Ocean. (Assume the wavelength is 200 km (200,000 meters), and the average depth of the Pacific Ocean is 4 km (4000 meters).

Round your answer to make it a whole number. See the following examples:

450.7 will be rounded to 451

450.03 will be rounded to 450

Question 25**1 pts**

What happens when the sun, moon, and earth are at right angles to each other?

- ☐ the moon is new or full and spring tides occur
- ☐ the moon is in its quarter phases and spring tides occur
- ☐ the moon is in its quarter phases and neap tides occur
- ☐ the moon is either new or full and neap tides occur

Question 26**1 pts**

The Equilibrium Theory of tides does not take into account

- ☐ all of these choices are correct
- ☐ the shape of coastlines
- ☐ tides as a shallow-water wave
- ☐ shape of ocean basins

Question 27**1 pts**

How many high tides usually occur each day in southern California?

- ☐ 4
- ☐ 3

☐ 2☐ 1**Question 28****1 pts**

Two unequal high tides and two unequal low tides are called

- ☐ diurnal tides
- ☐ solar tides
- ☐ mixed tides (mixed semidiurnal)
- ☐ semidiurnal tides

Question 29**1 pts**

Which is true regarding erosional coasts?

- ☐ make up about 70% of US coasts and are usually sandy
- ☐ make up about 30% of US coasts and are usually rocky
- ☐ make up about 70% of US coasts and are usually rocky
- ☐ make up about 30% of US coasts and are usually sandy

Question 30**1 pts**

All of the following are characteristics of the US Pacific coast EXCEPT

- ☐ active margin

- ☐ beaches are interrupted by headlands
- ☐ sediments come from eroded nearby shore
- ☐ longshore current usually flows southward

Question 31**1 pts**

All life must have a replicating system of passing on information.

- ☐ True
- ☐ False

Question 32**1 pts**

Fossils of living can be found as far back as 5.7 billion years ago.

- ☐ True
- ☐ False

Question 33**1 pts**

Which of the following is NOT true about evolution?

- ☐ mutations are necessary for variation
- ☐ those most fit for their environment leave the most progeny
- ☐ undesirable characteristics are selected against
- ☐ individual organisms evolve to fit their environment

Question 34**1 pts**

In general, the most successful organisms in a community have the most surviving offspring.

- ☐ True
- ☐ False

Question 35**1 pts**

A large reduction in the number of species living at a particular point in geologic time is known as

- ☐ an evolutionary event
- ☐ an impact event
- ☐ a mass extinction
- ☐ coevolution
- ☐ a selected extinction

Question 36**1 pts**

What season does phytoplankton peak in the northern temperate zone?

- ☐ Summer
- ☐ Fall
- ☐ Winter

- ☐ Spring

Question 37**1 pts**

What is essential in the restoration and continuation of photosynthetic productivity in the ocean?

- ☐ Blooming
- ☐ Upwelling
- ☐ Light
- ☐ Carbon dioxide

Question 38**1 pts**

What four requirements do primary producers need to photosynthesize?

- ☐ Water, carbon dioxide, light and nutrients.
- ☐ Carbon dioxide, heat, nutrients, phosphorus.
- ☐ Water, carbon monoxide, sulfur, heat.
- ☐ Those found near hydrothermal vents.

Question 39**1 pts**

What are plankton?

- ☐ photosynthetic organisms
- ☐

internal organisms

- ☐ drifting organisms
- ☐ microscopic organisms

Question 40**1 pts**

Corals have a symbiotic relationship with

- ☐ diatoms
- ☐ certain species of dinoflagellates
- ☐ certain species of protozoa
- ☐ various species of red algae

Question 41**1 pts**

Which whales use echolocation to find food?

- ☐ toothed whales
- ☐ baleen whales
- ☐ arctic whales
- ☐ pinnipeds

Question 42**1 pts**

Which of the following events allowed for aerobic respiration and thus, the evolution of animals?

- ☐ oxygen revolution
- ☐ anerobic fermentation
- ☐ ozone accumulation
- ☐ break up of Pangaea

Question 43**1 pts**

Schooling is a way for fish to avoid predation.

- ☐ True
- ☐ False

Question 44**1 pts**

Which group of vertebrates is most successful in terms of numbers of species?

- ☐ Birds
- ☐ Fishes
- ☐ Reptiles
- ☐ Mammals

Question 45**1 pts**

Which birds have tube-like plumbing in their bill for sensing air speed, and ducting saline water?

- ☐ Herons and Egrets
- ☐ Plovers and Sandpipers
- ☐ Penguins
- ☐ Albatrosses, Petrels, and Shearwaters
- ☐ Gulls

Question 46**1 pts**

Which group of marine animals generate their own body heat, create their own metabolic water, and evolved from ancestors that walked on land?

- ☐ reptiles
- ☐ marine mammals
- ☐ bony fishes
- ☐ cartilaginous fishes

Question 47**1 pts**

Parasites usually kill their hosts.

- ☐ True
- ☐ False

Question 48**1 pts**

The usual rigors of the intertidal zone are less severe in the sandy intertidal than the rocky intertidal.

- ☐ True
- ☐ False

Question 49**1 pts**

How are hydrothermal vent communities able to get energy?

- ☐ chemosynthetic bacteria
- ☐ bioluminescent bacteria
- ☐ hydrothermal energy
- ☐ photosynthetic plankton

Question 50**1 pts**

A symbiotic relationship where the symbiont is benefited while the host is neither benefited nor harmed.

- ☐ simple symbiosis
- ☐ obligate mutualism
- ☐ commensalism
- ☐ facultative mutualism
- ☐ parasitism

Question 51**1 pts**

What is the most important commercial product from marine algae?

- ☐ algin
- ☐ carrageenin
- ☐ agar
- ☐ biofules

Question 52**1 pts**

Bottom trawling is devastating because there is habitat destruction in addition to any bycatch.

- ☐ True
- ☐ False

Question 53**1 pts**

Most harvested marine animals are sustainable because they are being caught below the maximum sustainable yield.

- ☐ True
- ☐ False

Question 54**1 pts**

In trying to clean up past oil spills, chemical dispersants were used which

- ☐ turned the crude oil into tar balls that then were buried in the sediment
- ☐ cause oil to float to the surface making it easier to clean up
- ☐ sometimes did more harm than good
- ☐ were inactivated by UV radiation and were useless

Question 55

1 pts

How will increased emissions of carbon dioxide affect the oceans?

- ☐ oxygen levels will lower which favor gelatinous invertebrates over commercially important fishes
- ☐ the pH of the ocean will rise above the ideal levels
- ☐ primary productivity will decline
- ☐ corals, plankton, and other organisms will fail to form strong skeletons
- ☐ the distribution of kelp forests will spread due to the increased availability of carbon

Question 56

1 pts

Many harbors and marinas (like you see in Long Beach) used to be

- ☐ rocky shores and headlands
- ☐ mangrove forests
- ☐ intertidal sandy beaches
- ☐ No answer text provided.
- ☐ estuaries

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Question 60**10 pts**

This question is about WIND WAVES / SWELLS.

A. List and explain the necessary factors and conditions for wind waves to develop in the ocean.

B. Describe what occurs to these waves AFTER they first develop (in other words, describe how the waves travel from where they formed to other locations, like a beach/coastline)

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Question 57

1 pts

How have we tried to reduce the potential for oils spills?

- ☐ improved training for workers
- ☐ all of these are correct
- ☐ redundante fail-safe components on oil platforms
- ☐ improved hull design for oil tankers

Question 58

1 pts

What is the largest source of oil that ends up in the ocean?

- ☐ spills from oil rigs
- ☐ urban runoff
- ☐ natural seeps
- ☐ spills from tankers

Question 59

10 pts

This question is about PLATE TECTONICS.

Explain what is happening and why it is happening at: A) convergent plate boundaries and B) divergent plate boundaries.

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Question 61**10 pts**

This question is about the INTERTIDAL ZONE.

A) Why is the intertidal zone such a difficult habitat for organisms to survive in?

B) Describe at least FOUR adaptations that permit intertidal organisms to survive in the intertidal zone (Be specific; tell me the name of the organism and explain the special feature, behavior or structure that makes it possible for this organism to survive in the intertidal zone).

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Question 62**10 pts**

This is a two part question:

A) What role does the ocean play in the possible regulation of greenhouse gasses?

B) How might we be able to increase this effect?

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