

Midterm Exam

Started: Oct 19 at 12:52pm

Quiz Instructions

Directions for Midterm Exam

1. Once you begin the exam, you will have 300 minutes (5 hours) to complete and submit your exam. Be sure to begin the exam early enough so that you can complete it and submit it before the due date (Oct 21, 6:00 pm PST).
2. Multiple attempts are not allowed.
3. You must work individually on your exam, but you are allowed to use your notes, book, the internet, or any other resources. I wrote these questions based on your textbook and video episodes.
4. Essay questions will be manually graded by me (your instructor) and therefore it may be a few days before you can see your final score.

Question 1 2 pts	Moving air accounts for what proportion of heat moving toward the poles? ☐ zero ☐ 1/3 ☐ 50% ☒ 2/3 63.33 2/3 1/3 50%
Question 2 2 pts	What substance was able to show previous orientations of Earth's magnetic field? ☐ Basalt ☐ Magnesium ☐ Magma 1/3 2/3 50%

Question 3

2 pts

What characteristic is associated with convergent plate boundaries?

☐ New crust formation

☒ Violent geological activity

☐ Solidification of crust materials

☐ Spreading zones

Question 4

2 pts

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

☒ The density of the crust

☐ The amount of water that overlies the crust

☐ The direction of movement (north or south)

☐ The speed of the crust movement

all the way

Question 5

2 pts

Density is defined as:

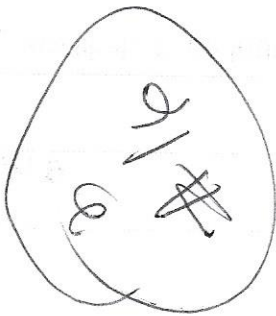
☐ layers that are separated

- ☐ the speed with which liquid moves
- ☐ the weight of a substance
- ☒ the mass per unit of volume

Question 6

2 pts

What is NOT a general characteristic of an active margin?



- ☒ Varied topography
- ☐ A broad shelf
- ☐ Little sedimentation
- ☒ Coincides with a plate boundary
- ☒ Volcanism and earthquakes

Question 7

2 pts

Where are abyssal plains most common?

- ☒ Atlantic Ocean Basin
- ☐ Pacific Ocean Basin
- ☐ Abyssal plains are equally common in all ocean basins
- ☐ Indian Ocean Basin

Question 8

2 pts

What process accounts for the layers found in Earth?

☐ Continental drift

☐ Accretion

☐ Plate tectonics

☒ Density stratification

Question 10

2 pts

_____ are likely to be found in subduction zones.

☐ Mid-ocean ridges

☒ Trenches

☐ Submarine canyons

☐ Abyssal hills

Question 9

2 pts

What offsets the mid-Atlantic ridge's movement at fairly regular intervals?

☐ Seamounts

☐ Hydrothermal vents

☐ Cooling of the lithosphere

☒ Transform faults

Question 11

2 pts

Historically, which of the following processes had the most influence in irreversibly changing the composition of Earth's atmosphere and making it possible for the diversity of life, as we know it, to fully develop?

- ☐ Chemical breakup of water vapor by sunlight
- ☐ Formation of carbonic acid in the ocean
- ☒ Production of oxygen from chemo- and photosynthesis
- ☐ Fluctuation in the atmospheric composition

Question 12

2 pts

What is NOT a possible reason for temperature fluctuations on early Earth and subsequently in the ocean?

- ☒ Accretion
- ☐ Outgassing
- ☐ Changes in solar output
- ☐ Composition of volcanic gases

Question 13

2 pts

Hydrogen bonds are:

- ☐ Weak in ice, moderate in liquid water and strong in water vapor
- ☐ Weak in water with low pH and strong in water with high pH
- ☒ Weak and temporary in liquid water

☐ polar and covalent

Question 14

2 pts

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

☐ increasing photosynthetic production of carbon dioxide.

☐ increasing photosynthetic production of oxygen.

☐ increasing photosynthetic use of oxygen.

☒ increasing photosynthetic use of carbon dioxide.

Question 15

2 pts

Which of the following sediment types (based on size) are among the most common in the ocean?

☒ sand, silt, and clay

☐ sand and pebbles

☐ boulders, cobbles, and sand

☐ pebbles and cobble

#6 5/27/20

Question 16

2 pts

What kind of information can marine microfossils NOT provide?

☒ Changes in the orientation of the magnetic poles

- ☐ Productivity of the marine biosphere and upwelling
- ☐ Temperature variations in the surface and deep water.
- ☐ Patterns in ocean circulation

Question 17

2 pts

What two factors increase the speed of sound in the ocean?

- ☒ high temperature and low pressure
- ☐ low temperature and low pressure
- ☐ low temperature and high pressure
- ☐ high temperature and high pressure

Question 18

2 pts

Which of these factors has the least effect on air's density?

- ☒ water content
- ☐ temperature
- ☐ distance from the surface of the Earth
- ☐ argon content

Question 19

2 pts

What is true of the Intertropical Convergence zone (ITCZ)?

☒ It is subject to seasonal variations.

☐ It is the result of the convergence of a Hadley cell and Ferrel cell

☐ It coincides with areas of strong winds.

☐ It coincides with the geographical equator.

Question 20

2 pts

Why do marine scientists take core samples from coral reefs?

☐ to determine if the coral reef is composed of silica (from siliceous sediments) or calcium carbonate (from calcareous sediments)

☐ to look at the rings of calcium carbonate to discover past sea level and sediment run off

☐ to look at the rings of calcium carbonate to determine the rate of reef erosion by waves and ocean acidity

☐ to determine the age of the sea floor and the rate of sea floor spreading

Question 21

2 pts

Why is biosynthesis unlikely to occur today as it did in Earth's youth?

☐ There is less available oxygen in the atmosphere

☐ All of the above are true

☐ Ozone is less protective from the sun's influence

☒ Living organisms have altered oceanic and atmospheric conditions

Question 22

2 pts

Where did most of the elements come from that make up the earth and its life forms?

- ☐ stars
- ☐ background radiation
- ☐ outgassing
- ☐ other planets
- ☐ asteroid impacts

Question 23

2 pts

Why is it important to measure salinity levels throughout the oceans?

- ☐ salinity affects fish populations and thus productivity and coastal economy
- ☐ salinity affects density and thus ocean circulation
- ☐ salinity differences from place to place help us to understand where storms and hurricanes are generated
- ☐ knowing the salinity level of an ocean area allows us to predict the intensity hurricane generation

Question 24

2 pts

Which is true of oceanic crust?

- ☐ made of granite and less dense than continental crust
- ☐ made of basalt and more dense than continental crust
- ☐ made of basalt and less dense than continental crust

2 pts

Question 27

- You learned in video episode 9 that polar seas are more *productive* than tropical seas? In this context, *production* is a measurement of
- ☐ photosynthesis
 - ☐ temperature extremes
 - ☐ symbiosis
 - ☐ sun light
 - ☐ predation

2 pts

Question 26

- What causes the sustained heat within the Earth's interior?
- ☐ Isostatic equilibrium
 - ☐ Conduction
 - ☒ Radioactive decay
 - ☐ Convection
 - ☐ The Sun

2 pts

Question 25

- ☐ made of granite and more dense than continental crust

As pure water cools and approaches its freezing point, the density decreases. Why does this happen?

- ☒ The hydrogen bonds become rigid, allowing it to expand slightly.
- ☐ The hydrogen bonds break as the molecules compress.
- ☐ The water compresses into ice.
- ☐ Ice takes up a smaller surface area than liquid water.

~~CC~~

- What is the main reason for the stratification in the north polar waters?
- ☒ Salinity
 - ☐ Pressure
 - ☐ Depth
 - ☐ Temperature

Question 28

2 pts

Water requires a lot of heat energy to raise one gram by one degree Celsius. This describes what property of water?

- ☒ heat capacity
- ☐ sensible heat

Question 29

2 pts

- ☐ latent heat of fusion
- ☐ temperature variance

Question 30

2 pts

Which statement is true regarding oxygen in seawater?

- ☐ there is more in the ocean compared to the atmosphere because it is added by the respiration of animals
- ☐ there is more in the ocean compared to the atmosphere because of decomposition of plant and animal remains
- ☒ there is less in the ocean compared to the atmosphere and may limit the distribution of some animals.
- ☐ there is less in the ocean compared to the atmosphere because of the oxidation of metal ions in seawater

Question 31

2 pts

Why does the ocean not boil or freeze solid in different regions of the world?

- ☐ Heat is able to be transferred to water vapor.
- ☒ Heat is transported by oceanic and atmospheric circulation.
- ☐ The latent heat of fusion and vaporization balance the heat energy inputs and outputs.
- ☐ The thermal inertia of water is low in certain regions.

2 pts

Question 32

What kind of sediments are associated with the erosion of land?

- ☒ Terrigenous
- ☐ Cosmogenous
- ☐ Hydrogenous
- ☐ Biogenous

Handwritten notes: "H/S" and an arrow pointing to the "Terrigenous" option.

2 pts

Question 33

What statement is true of biogenous and terrigenous sediments?

- ☐ Terrigenous sediments make up a larger area than biogenous sediments.
- ☐ Biogenous sediments make up more volume than terrigenous sediments.
- ☐ Terrigenous and biogenous sediments are equal in area and volume.
- ☒ Biogenous sediments cover a larger area than terrigenous sediments.

2 pts

Question 34

Since sunlight does not reach hydrothermal vents, how can so many species live there?

- ☐ the high density deep water allows carbon compounds to be synthesized directly from the erupting magma
- ☐ downwelling of surface nutrients
- ☐ basalt is converted by heat into carbon compounds
- ☐ mineral such as sulfide are used to build organic compounds

Question 35

2 pts

What is the ultimate fate of our sun and the earth?

- ☐ The sun will become a supernova and engulf the earth in about 5 billion years.
- ☒ The sun will swell into a red giant and engulf the earth in about 5 billion years.
- ☐ The sun will slowly fade to become a black hole and draw in the earth in about 5 billion years.
- ☐ The sun will become a supernova and engulf the earth in about 5 million years.

Question 36

2 pts

A deep ocean ooze was discovered near Antarctica. What type is it likely to be?

- ☐ Radiolarian ooze
- ☒ Diatom ooze
- ☐ Basaltic ooze
- ☐ Calcareous ooze

Question 37

4 pts

For each expedition on the left choose the correct matching statement on the right.

Captain Cook's expeditions

[Choose]

US Exploring Expedition

[Choose] ▼

Challenger Expedition

[Choose] ▼

Question 38

2 pts

How does water affect sunlight?

- ☐ Blue light typically penetrates deeper than red.
- ☐ all colors penetrate the same, but their intensity drops with increased depth
- ☐ Red or blue can penetrate equally depending on pressure and salinity
- ☐ Red light typically penetrates deeper than blue

Question 39

2 pts

Which statement is true regarding pH in the ocean?

- ☒ The pH near the surface is higher because of lower amounts of carbon dioxide.
- ☐ The pH of deep water is lower because carbon dioxide is nearly absent there.
- ☐ The pH of deep water is higher because carbon dioxide is nearly absent there.
- ☐ The pH near the surface is lower because of lower amounts of carbon dioxide.

Question 40

10 pts

10 pts

Part A) What are the three major types of plate boundaries found on earth and how are they different from each other?

where that boundary exists.

- What is a hurricane?
- What gives hurricanes their power?
- What aspect of a hurricane causes the most coastal damage?
- What is a storm surge?
- Why do hurricanes lose power when they hit land?

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