

Exam #1. 10:30 Section. Fall 1999

Name: _____

SS# _____

Please make sure to mark your answers clearly on the scan-tron. If they are not marked clearly, the computer will grade them wrong. **Please use only a #2 pencil.** Good luck!

Multiple Choice: 2 Points each. Make sure to read all the answers before you choose one.

1. Most atolls in the Pacific are believed to have formed by:

- a) Nuclear testing
- b) Coral growth on banks built up by sediments
- c) Coral growth on subsiding volcanic foundations
- d) Global thermal subsidence

2. The Hawaiian-Emperor seamount chain is an example of:

- a) An aseismic ridge
- b) A mid-ocean ridge
- c) A volcanic arc
- d) A hot-spot trace
- e) A subduction zone

3. The Pacific plate is moving in a NW direction at about:

- a) 0.5 cm/yr
- b) 2 cm/yr
- c) 10 cm/yr
- d) 20 cm/yr

4. Free Oxygen in the Earth's atmosphere has been produced mainly by:

- a) Photodissociation of water and loss of hydrogen to outer space
- b) Change in sea level
- c) Formation of the earth's core
- d) Photosynthesis and burial of organic carbon
- e) Nucleosynthesis in stars

5. Continents are built by: a) Andestitic volcanism at subduction zones b) Basaltic volcanism at mid ocean ridges c) Accretion of exotic terranes onto their margins d) Outgassing of volatiles from the earth's interior e) Both a and c

6. We know that the outer core of the earth is liquid in part because: a) No earthquakes occur there b) The plates move c) Seismic "s" waves do not travel through it d) The deep sea drilling project drilled there e) The increased pressure melts the rock into a liquid

7. Turbidity currents lead to the formation of a) Graded deposits b) Submarine canyons c) Sediment fans d) Distribution channels e) All of these

8. The principle of isostasy states that: a) The earth's surface is dominated by two levels: the continents and the oceans b) The lithosphere is in gravitational equilibrium through a buoyancy mechanism, with compensation occurring in the asthenosphere c) Crust is produced by differentiation from the mantle, by upwelling and solidification of molten rock d)

If the earth were perfectly smooth, it would be covered by nearly 3000m of ocean water e) As you move north along the Hawaiian island chain, the island get smaller until they are below the water level

9. Which of the following does not involve the creation or destruction of oceanic crust: a) A mid ocean ridge b) A transform fault c) A subduction zone

10. In 1966, Matthews& Vine presented evidence which finally convinced geologists that sea-floor spreading is real. This evidence involved: a) Earthquake patterns at deep-sea trenches b) Patterns of coral reef growth and development c) Direct sampling of ocean floor crustal rocks d) Magnetic patterns measured at oceanic ridges e) Gravity measurements taken at sea

11. Red-shifting of light from stars occurs because they are a) Hot b) Made up of hydrogen c) Moving away from us d) Moving toward us

12. Terrigenous material can get to the ocean by: a) Rivers b) Wind c) Glaciers d) Turbidity currents e) All of the above.

13. The major forces driving the plates in the theory of plate tectonics are: a) Inertia and mass balance b) Convection currents and centrifugal force c) Gravitational pull and convection currents d) Refraction and isostasy e) Diagenesis and blue shift.

14. The San Andreas Fault, in California is an example of a: a) Spreading center b) Passive margin c) Back arc basin d) Transform fault e) A good place to buy real estate

15. Which of the following would not be found at the surface of the sediments below 4500 m water depth in the oceans? a) Red clay b) Siliceous ooze c) Ferromanganese nodules d) Calcareous ooze

16. The first person to calculate the circumference of the Earth accurately was: a) Erasthones b) Hypatia c) Ptolemy d) Hipparchus e) Fred McKenzie

17. Polynesians first settled Fiji and other western Pacific islands around a) 20,000 yrs ago b) 10,000 yrs ago c) 1300-1100 BC d) 600-900 A.D.

18. Polynesian navigation relies on which factors in order to expand the island target a) Deflected swells b) Cloud patterns c) Homing birds d) Reflections in the sky e) All of the above

19. Polynesian navigation uses a: a) Home-reference system b) Self-center reference system c) GPS d) Farmers' almanac to determine when it is best to put out to sea

True and False Questions. 1 Point Each mark A=True OR B=False

20. Aristarchus was the first person we know of, who proposed that the Sun was at the center of the known Universe

21. Yellowstone is an example of a hot spot.

22. Parallax is a method used to determine the distance to stars up to 100 light years away.
23. The bend in the Hawaii-Emperor sea mount chain is due to a reversal of the magnetic field which occurred twenty million years ago.
24. Erosion from continents is a significant source of sediment in the oceans.
25. The CCD is defined as the depth at which coral cannot live because of lack of nutrients and light.
26. Pelagic deposits accumulate approximately 5-10 times faster than terrigenous sediments.

27. Pteropods are a kind of foraminifera.
28. The test of a scientific theory is that it can explain all observations.
29. CaCO₃ tends to dissolve much more slowly than silica in the deep ocean.
30. Explosive volcanism is associated with Pacific type continental margins.
31. The island of Oahu was once a guyot.
32. Solar luminosity has increased over the last 4 billion years.
33. The lithosphere is usually described as "plastic"
34. Coccolithophores are plants that secrete siliceous skeletons.
35. The oldest rocks on the seafloor are much older than the oldest rocks from the continents.
36. The transport of sand by water along coastal cells is known as a rip-current
37. Sediment coverage increases with increasing distance from the mid ocean ridge system.
38. Sediments are much thicker in the Atlantic ocean than the Pacific.
39. The bend in the chain defined by the Emperor Seamounts and the islands of the Hawaiian Archipelago results from a reversal in the magnetic field of the Earth.

Fill in the blanks (1 point for each blank - if you don't know, make an educated guess)

40. The newest Hawaiian Island, as seen from the submersible in "Hawaii, born of Fire" is called
41. Three causes of global sea level change are _____ and _____

Essay Questions. Please answer in the spaces provided. Be concise.

Draw a typical divergent plate boundary. Label the major parts and show the directions of movement. Name a geographical location where such a boundary occurs (5 points).

Draw a cross section of the earth. Name the layers as described by their physical and chemical properties. Please be very clear. (8 points).