

OCEANOGRAPHY 201

Spring 2001

Exam 1 - Section 1

Section: _____

Name: _____

Social Security No.: _____ - _____ - _____ - -

PART I

Mark multiple choice and true/false answers on the answer sheet in dark pencil.

1. Multiple choice: pick the best answer

1. At 400 km depth in a Wadati-Benioff zone one would expect to find: a) deep earthquake foci b) andesite c) manganese nodules d) shallow volcanism e) a hot spot
2. Compared to oceanic crust the density of the continental crust is : a) the same b) higher c) lower d) not measurable e) lower in the north, higher in the south
3. Ice ages cause: a) the magnetic field to reverse b) sea level to drop c) the earth to warm d) sea level to rise e) increased volcanic eruption
4. Milankovitch cycles are variations in: a) volcanism b) ice production c) the earth's orbit d) plate motion e) sedimentation rate
5. Hjulstrom's work on sediment transport is important for- a) plate tectonics b) manganese nodule formation c) submersible design d) climate change e) coastal engineering
6. A subducting plate will generate: a) andesite volcanoes on the landward side b) granite volcanoes on the seaward side c) fracture zones near the axis d) a hot spot at the base of the trench e) sediment volcanoes
7. The ocean formed about how many years ago: a) 10 million b) 4 million c) 15 billion d) 4 billion e) 4.6 million
8. The reason seismic 's' waves will not travel through part of the earth's core is because it is: a) too deep b) too hot c) too dense d) liquid e) plastic
9. The principle of isostatic equilibrium requires that when an ice sheet melts off a continent that the continent will: a) sink b) rise c) break up d) move laterally e) stay the same
10. In the theory of plate tectonics the plastic layer supporting the plates is known as the: a) mesosphere b) mantle c) lithosphere a) asthenosphere e) tectonosphere
11. The highest point on a beach is called the: a) longshore bar b) backshore trough c) berm crest d) foreshore dune line e) inshore bar
12. Cosmogenous sediment is important because: a) it reveals past climate b) it is economically important c) it is a source of oil d) it covers a large percentage of the ocean bottom e) it may contain evidence of life from space

13. Mantle plumes: a) move along with plates b) come from great depth perhaps the core /mantle boundary c) are very young d) are caused by subduction e) never form under continents
14. An abyssal hill is: a) a guyot that sank b) less than 1000 m in height c) very volcanically active d) created by turbidity currents e) less than 1000 meters in height
15. A continental margin that was not near a plate boundary and has no earthquakes would be called a: a) transform margin b) Pacific type margin c) Atlantic type margin d) a hot spot margin e) Indian Ocean type margin
16. The 'Pacific Rim of Fire' is characterized by margins that from a Plate Tectonic view are: a) fractured b) divergent c) passive and convergent d) active and divergent e) active and convergent
17. The earth's core is primarily made of: a) granite b) basalt c) magnesium d) silica, magnesium and iron e) iron and nickel
18. Eratosthenes found the earth's circumference at the equator to be about: a) 25,000 miles b) 25,000 meters c) 2,500 miles d) 6,000 km e) 100,000 miles
19. Island groups formed behind a trench are called: a) barrier islands b) hot spot islands c) trench islands d) island arcs e) sea islands
20. The approximate density of the mantle in gm/cm^3 would be a) 5.5 b) 4.5 c) 2.9 d) 2.7 e) 10
21. If we drilled into the center of an atoll at some depth we would come upon which rock type? a) granite b) basalt c) polymetallic sulfide d) marble e) andesite
22. Longshore drift is : a) erosion of silt on the continental shelf b) transport of water offshore c) transport of sand down canyons d) transport of sediment along beaches e) deposition of sand on the abyssal plain
23. Sediment fans accumulate at the mouths of a) fjords b) trenches c) submarine canyons d) barrier islands e) sea arches
24. The discovery of graded bedding in a sediment core indicates the passage of a: a) turbidity current b) hot spot c) Milankovitch cycle d) fracture zone e) hydrothermal vent
25. If all calcium carbonate shells disappear below a point in a sediment core this probably indicates the a) hydrothermal history of the core b) passage through the CCD c) an earthquake d) increased growth of diatoms e) a magnetic reversal
26. As seafloor moves hundreds of kilometers away from a spreading center it: a) heats b) becomes more earthquake prone c) cools and sinks d) becomes more volcanic e) becomes more magnetic
27. Moving northwest along the Hawaiian island chain the islands: a) become younger b) are all the same age c) rise higher out of the sea d) get older, sinking and eroding e) break up in fracture zones.
28. During strong winter storms a beach might typically get: a) flatter b) wider c) steeper and covered by coarser grained material d) beaches never change e) all of the above
29. As a volcanic primary coast starts to erode to form a secondary coast some of the typical features which might form are: a) sea arches b) sea caves c) sea stacks d) blow holes e) all of the above

30. We can learn about the earth's past climate from: a) the earth's magnetic field b) the earth's gravitational field c) the mesosphere d) sediment cores e) moon rocks
31. The transition point between a continental shelf and slope is called a:
a) continental rise b) shelf break c) transform fault d) Pacific margin e) barrier break
32. The lithosphere contains both: a) continental and oceanic crust b) mantle and-outer core c) the mesosphere and asthenosphere d) the inner and outer core of the earth e) none of the above
33. Some of the main economic metals found in manganese nodules include: a) gold and silver b) lead and zinc c) magnesium, silica and iron d) copper, nickel and cobalt e) gold , platinum and mercury
34. When continents collide on converging plates we generally get: a) a mid-ocean ridge b) a trench c) a mountain range d) a continental rise e) none of the above
35. The main force driving plate tectonics is: a) centrifugal force b) isostatic equilibrium c) seismic wave propagation d) the downward pull of the descending plate e) the upward push of rock at a spreading center

PART II True-False Questions (A = True; B = False)

Put answers on the answer sheet

36. Wegener cited guyots as a major piece of evidence for magnetic reversals.
37. Terrigenous sediments occupy about 45% of the seafloor.
38. Since the sedimentation rate for biogenous sediments is 10 times that of terrigenous sediments they occupy 10 times as much seafloor.
39. Fracture zones generally break up island arcs.
40. The Hawaiian Hot spot is presently near the island of Midway.
41. The Marianas Islands and the Hawaiian Islands both formed the same way.
42. Basalt would have the same density on the earth or the moon even though its weight would be different.
43. Marine chronometers have been used in longitude measurement.
44. Deep sea hydrothermal vent areas are characterized by life forms that do not rely on sunlight and by accumulations of valuable minerals.
45. The first idea for sea floor spreading came from Magellan after long discussions with Prince Henry the Navigator.
46. Another Hawaiian Island is now forming but is still a seamount.
47. Oahu was once a guyot.
48. The earth's gravitational field is best measured with a highly accurate compass.

49. At a few places the mid Atlantic Ridge is so high that it forms islands.
50. Sediments are classified both by particle size and by origin.
51. Dividing the mass of an object by its volume gives its average density.
52. The lithosphere is a plastic layer in the earth's mantle generating extremely shallow earthquakes.
53. Geophysical techniques help us to understand the layering of the earth.
54. The continental slope and rise form the transition between the shelf and the deep seafloor.
55. Much information about the past history of the ocean can be derived from deep ocean sediment cores.

PART III - Short Answer Questions

Answer questions in the space provided or on the back of this sheet.

56. (6 points) Draw a diagram of a subduction zone labeling 5 important features.

57. (6 points) State the approximate date and importance of the following six people or expeditions:

Magellan

Captain Cook

H.M.S. Challenger

Alfred Wegener

Meteor Expedition

Glomar Challenger

58. (8 points) Give 4 geophysical techniques and what each can tell us about the earth.