EXAM 1 Part 1

A. Print the following on your scantron
   Your first and last name
   Today’s date
   Which section you are in (MW or TTh)
   CODENAME

B. Exam Format:
   First section: slide show – 30 seconds per slide
   Second section: the rest of the exam questions
   Closed book exam. No calculators, cell phones, lap tops, palm pilots, etc.
   You are responsible for preventing other students from cheating off of your exam
   There is another class in the room after the exam Students who need more time may continue
   working on the exam in the center area; however
   Students who arrive late may not work past the standard ending time for the class.
   Warning: go to the restroom before the exam. You may not leave the room once you start the
   exam.

C. For all questions, choose the best answer from the selection provided.
   Answers can (and will) repeat – do not worry about that
   choose the best answer for each question

D. For the on-screen slides
   each slide will stay on the screen for 30 seconds
   the slides will loop and repeat for the rest of the exam period
   you have thumbnail versions of each of the slides on the attached pages
   you may use the computers in the adjacent room to view the slides at your own pace
   - use the arrow keys to control the slideshow

E. Your score
   there are 100 questions – of these the first three that you miss will not hurt your score
   you may apply these 3 “freebies” to questions that you do not “like”, to questions where you smear
   the answers on your scantron, or to questions that you simply do not know
   you do not need to indicate which questions you want thrown out – the first three that you miss will
   be the ones thrown out for you
   your score will be calculated by dividing the number you get correct by 97
   if you get all 100 questions correct, you will earn extra credit

F. Grades
   will be posted over the next few days
   will be posted on the outside bulletin board first and then on my website
   will be posted by the codenames that you chose on the first exam

G. When you are finished with the exam
   turn in your 2 text booklets and your scantron
   leave, very very quietly so that you do not disturb students who are still working on the exam
### PART 1

Questions 1-12 refer to slides on the front screen. Each slide will be displayed for 30 seconds and the slide show will continuously loop and repeat. Choose from the entire list below for each of the answers. Answers may repeat and not all answers will be used. For answers with multiple letters, bubble-in all letters indicated for that question. For example, if your answer is the Midway Island, then bubble in “a, b, and d” for that question.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
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<tbody>
<tr>
<td>1.</td>
<td>Aleutian Islands - a</td>
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<td>2.</td>
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<td>3.</td>
<td>Antarctica - c</td>
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<td>4.</td>
<td>Appalachian Mountains - d</td>
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<td>5.</td>
<td>Arabian Sea - e</td>
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<td>6.</td>
<td>Azores - ab</td>
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<td>7.</td>
<td>Bahamas - ac</td>
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<td>8.</td>
<td>Bay of Fundy - ad</td>
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<td>9.</td>
<td>Bering Sea - ae</td>
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<td>10.</td>
<td>Bermuda - bc</td>
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<td>11.</td>
<td>Borneo - bd</td>
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<td>12.</td>
<td>British Isles - be</td>
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<td>Canary Islands - cd</td>
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<td>Cape Horn - ce</td>
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<td>Cape of Good Hope - de</td>
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<td>Caribbean Sea - abc</td>
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<td>Cascade Range - abd</td>
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<td>Channel Islands - abe</td>
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<td>Christmas Island - acd</td>
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<td>Coral Sea - ace</td>
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<td></td>
<td>Crete - ade</td>
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<td></td>
<td>Cyprus - bcd</td>
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</table>

Emperor Seamount Chain - bde
For questions 13-19, refer to the pictures displayed on the front screen.
Each picture will stay on the screen for 30 seconds.

Choose the **best answer** from the **ENTIRE** list of answers below.
Answers will REPEAT. Don't worry about it.

If there is more that one VERY GOOD answer for a question, then all VERY GOOD answers will have the same letter. For example, if Question 16 were the San Andreas Fault, the answer would be "e" -- also appropriate would be "transform margin" whose answer is also "e".

13. ______________________
   a. Divergent
   e. Transform margin
   b. ocean-to-ocean and/or ocean-to-continent
   d. continent-to-continent collision
   c. Hot spot islands

14. ______________________
   a. Iceland
   a. Mid-oceanic ridge
   e. San Andreas Fault
   b. A sea that is getting smaller
   a. A sea that is getting wider

15. ______________________
   b. Subduction
   b. Trenches

16. ______________________
   a. an active volcanic mountain ridge

17. ______________________

18. ______________________

19. ______________________
**MARINE LIFE ID**

For EACH photo, pick the best answer from ENTIRE list of choices provided
- be as specific as possible.
Answers and/or letters may repeat.

Example: if Photo #27 was an oyster, then you would bubble in ‘a, b and c’ on your scantron for #27.

20. ____________________
   abalone - a
   barnacle- b
   bryozoan - e
   cetacean- c
   clam- d
21. ____________________
   coral- ae
   crab- ab
   cuttlefish – bd
   deep sea life- d
22. ____________________
   dolphin- c
   eel- ad
   fish- ae
   hydrothermal vent life - d
   jelly (jellyfish) - bc
   kelp- bd
23. ____________________
   lobster- be
   manta ray- cd
   manatee (sea cow) - ce
   microplankton- de
24. ____________________
   mussel- abc
   nautilus- abd
   nudibranch- abe
   octopus- bcd
25. ____________________
   oyster- abc
   penguin- cde
   sand dollar- abcd
   sea anemone- acde
   sea cucumber- bcde
   sea hares- abcede
   seahorse- a
   seal or sea lion- b
   sea star- e
   brittle star- bc
   feather star (crinoid) - cd
   basket star- ce
   sea otter- d
   sea pen- ab
   sea turtle- abe
   sea urchin- ae
   scallop- abc
   shark- bed
   shrimp- cde
   snail- abe
   sponge- abcede
   squid- b
   stromatolites - cde
   stingray- abd
   tunicate- be
   walruses- abcd
   whales (cetaceans) - c
   "whale shark"- cde
   worms- a
PART 2

Use the indicated scantron sheet to answer the following questions.
For all multiple-choice questions, choose the best answer from the selection provided.

***********************************************************************

31. Which of the following is (are) NOT topic(s) that will be covered in this course?

32. What ocean covers roughly half of the globe?

33. If you scuba dive 25 fathoms deep, how deep are you?

34. If Kendra is driving along the beach in a jeep at 60 miles per hour and Dentral is waterskiing behind a boat at 60 knots, who is traveling faster?

35. Roughly, what percentage of the earth's surface is covered by oceans?

36. Of the two largest oceans, which one is widening?

37. Of the two largest oceans, which one is shrinking?

For the next 3 questions: You have been lucky enough to be asked on a dive of the submersible Trieste -into the deepest known region of the ocean.

38. Where will you be diving?

39. When your dive touches the bottom at this point, approximately how deep will you be?

40. What plate tectonic environment will you be exploring?

41. Sialic is an abbreviation for

42. Mafic is an abbreviation for

43. In general, continental rocks are mafic.
   • True  • False

44. In general ocean floor rocks are mafic lava rocks such as granite.
   • True  • False
45. Using your knowledge of the circumference and radius of the earth and the thickness of the ocean, which of the following is the closest to reality?
46. In which major ocean does the MOR split in three different directions (the MOR forms an "upside-down Y")?

47. How much of the earth’s surface is land (above sea level)?

48. Granite is mafic.
   • True  • False

49. Which of the following is an example of a convergent plate boundary?

50. Which of the following is an example of a transform plate boundary?

51. Basalt is mafic.
   • True  • False

52. Which of the following is FALSE?
   • the earth's early atmosphere was made primarily from volcanic gases
   • steam makes up 70-95% of the gases that escape from lava
   • Pangea was the only continent at the time of the formation of the earth and ocean
   • as the earth cooled, the volcanic steam condensed to form rain
   • over millions of years, this rain collected to form the ocean(s)

53. The ocean floor basalts are magnetized.
   • True  • False

54. The plates are broken pieces of the asthenosphere sliding over the upper mantle.
   • True  • False

55. In general, sialic rocks are lower density than mafic rocks.
   • True  • False

56. What is the average depth of the ocean?

57. What is the world's longest mountain range?

58. The Earth is the only planet known to have liquid water.
   • True  • False

59. The Earth is actually more than 4/5 water and less than 1/5 land.
   • True  • False

60. What major ocean has the most trenches?

61. What major ocean is mostly covered by ice?
62. Which of the following is **FALSE**?

- The earth's early ocean was not very salty and the seawater has gotten saltier with time and now the seawater contains as much salt as it can keep dissolved
- When water evaporates from the ocean, the dissolved minerals (salts) are left behind; that is, only pure water evaporates into the air -- this leaves the salts in the ocean
- Rainwater dissolves minerals from rocks, these dissolved minerals are washed down rivers and into the oceans
- Na (sodium) and Cl (chlorine) make up more than 85% of the dissolved salts that stay in solution in the ocean today
- Seawater is salty because the deep ocean floor is covered by a layer of salt that was formed when the earth solidified

63. In general, continental rocks are sialic.

- True
- False

64. In general ocean floor rocks are mafic lava rocks such as basalt.

- True
- False

65. Why does Plate Tectonics occur? (What causes the plates to move, etc.?)

66. What causes **most** earthquakes, volcanoes and mountain ranges?

67. The Earth is actually more than $\frac{2}{3}$ water and **less than** $\frac{1}{3}$ land.

- True
- False

68. In our Solar System, astronomers have discovered liquid water on Venus and Jupiter.

- True
- False

69. Granite is sialic.

- True
- False

70. The plates are broken pieces of the lithosphere sliding over the asthenosphere.

- True
- False

71. CO2 stands for

72. The world’s longest mountain range is made of basalt.

- True
- False

73. The Big Bang Theory refers to the accretion and differentiation of the melting earth in the Cenozoic.

- True
- False

74. The Big Bang is the theory of how and why Pangea broke apart.

- True
- False
75. Pangea was one of the Earth’s several supercontinents. 
   • True     • False
76. Approximately what percentage of the Earth’s surface is covered by the oceans?
77. What volcanically active island is actually the Mid-Atlantic Ridge exposed above the surface of the ocean?
78. Which of the following is an example of a famous, well-known and active Hot Spot?
79. Roughly, how fast are the earth's tectonic plates moving?
80. The earth's tectonic plates are broken pieces of the lithosphere. 
   The lithosphere is comprised of what?
81. The tectonic plates slide over what solid (yet "plastic") layer?
82. What causes earthquakes, volcanoes, mountains, the MOR and the jigsaw puzzle fit of the continents?
83. Continental rocks are up to 3.5 BILLION years old. Yet, the oldest oceanic rocks are only 200 million years old. **Where are the old oceanic rocks?**
84. Which of the following is an example of a divergent plate boundary?
85. What does the geometry of the Hawaiian-Emperor seamount chain imply?
86. What causes oceanic trenches?
87. What created the world's longest mountain range?
88. Which of the following is **FALSE**?
   • the seafloor is made of sediments (sand and mud) on top of basalt (black lava rock)
   • seafloor rocks are in a very simple pattern of stripes
   • seafloor rocks are youngest at the mid-oceanic ridge and get older away from the MOR
   • the mid-oceanic ridge is a 45,000+ mile-long volcano that is being ripped apart
   • the ocean is deepest in the middle
89. Which of the following is FALSE?
   • the Earth's magnetic field has totally reversed itself hundreds of times in the past
   • there were times in the Earth's past when all compass needles pointed SOUTH!
   • when the magnetic stripes on the ocean floor were discovered, geologists were surprised to discover that the Earth's magnetic field must have reversed many times in the past
   • the Earth's magnetic field is the same as the magnetic field from a bar magnet
   • the Earth's magnetic field is most probably created from the turbulent movement of electric currents in the Earth's liquid outer core

90. Sea Floor Spreading explains why the ocean floor is in a SYMMETRICAL, striped-pattern, AND why this pattern is centered on the MOR.
   • True   • False

91. Continental Drift is caused by Sea Floor Spreading.
   • True   • False

92. At which plate tectonic setting are volcanoes NOT usually created?

93. Which of the following creates ISLANDS?

94. Seafloor spreading, extrusion of volcanics at divergent plate boundaries and magnetic reversals resulted in what features on the ocean floor?

95. The Aleutian Islands are NOT

96. The solid rock on the ocean floor is

97. How much of the Earth’s surface is dry land (exposed above sea level)?

98. The astronomical observation that most objects in the universe are moving away from a central spot is the basic foundation for the Big Bang Theory.
   • True   • False

99. Astronomers and scientists have proven why all objects in the universe were in one spot and why it all exploded 20BYA.
   • True   • False

100. The structure and geology of the northern Appalachian mountains matches

101. A sextant is used to measure/calculate

102. In the 1700’s the problem of determining a ship’s longitude was solved by the invention of

103. Rocks from both land and the ocean floor show the same time-record of magnetic reversals.
   • True   • False
104. Rocks that are 250 MYO from equatorial Africa show evidence of glaciers while at the same time, 250MYO rocks from New York show evidence of tropical swamps.
   - True       •  False

105. In terms of plate tectonics, the Tahitian Islands are

106. A knot is just a little slower than a mile per hour.
   - True       •  False

107. A nautical mile is just 300 feet shorter than a regular (statute) land mile.
   - True       •  False

108. The bottom of the Marianas Trench is 20,000 Leagues Under the Sea.
   - True       •  False

109. Most swimming pools are 1-2 fathoms deep.
   - True       •  False

110. 1 league is 1000 fathoms.
   - True       •  False

111. One fathom is 6 feet.
   - True       •  False

112. If straightened out, the Mid-Oceanic Ridge is long enough that it could be wrapped around the equator – almost twice!
   - True       •  False

113. Polar Wandering and the Earth’s magnetic field (you were supposed to read about it in your book!) Which of the following is FALSE?
   - If the continents have never moved, then each continent has its own, separate polar wander path record
   - Today, in the northern hemisphere the magnetic field points north and down
   - Today, in the southern hemisphere the magnetic field points north and up
   - Polar wander paths match when the continents are reassembled as Pangea
   - The magnetic field has wandered over 90 degrees over 500 million years.
   - The term “apparent polar wander path” is used because the magnetic pole did not move – the continents did!

114. Polar Wander paths make sense….if the continents have moved as Pangea broke apart. (Apparent Polar Wandering is a topic that you have to read in your text).
   - True       •  False
Fact or Theory?

115. The Sun, the Earth and the other planets in our Solar System formed from the accretion of a spinning, collapsing nebula.
   • Fact
   • Theory

116. Most objects in the universe are moving away from a central spot.
   • Fact
   • Theory

117. The Big Bang
   • Fact
   • Theory

118. The sialic continents, mafic ocean floors, the crust, the mantle and the core were all formed while the early melted Earth cooled and differentiated as low density minerals floated to the surface and heavy, denser minerals sank to the center.
   • Fact
   • Theory

119. The water in the Earth's oceans came from the cooling and condensation of the steam in the Earth's early atmosphere of volcanic gases.
   • Fact
   • Theory

120. Volcanic gasses are basically boiling Perrier (generally 70-95% steam and up to 15% carbon dioxide) with some hydrogen sulfide gas for aroma.
   • Fact
   • Theory

121. 80-90% of the sand and mud that falls into the ocean is not in the ocean anymore.
   • Fact
   • Theory

122. All rocks of the same age, from land or from the ocean floor, are magnetized in the same direction when they are formed.
   • Fact
   • Theory

123. The Earth's magnetic field is similar to the magnetic field from a bar magnet.
   • Fact
   • Theory

124. The magnetic field from a current loop is the same as the magnetic field from a bar magnet.
   • Fact
   • Theory

125. The Earth's magnetic field is created by current loops in the molten outer core.
   • Fact
   • Theory

126. Mantle Convection
   • Fact
   • Theory

127. The Sun
   • Fact
   • Theory
For the following questions, refer to the explanations for the formation of the Earth as discussed in class and in the textbook.

128. As the Earth cooled, sialic lo-density minerals crystallized and floated to the surface where they accreted and formed early proto-continents.
   • True  • False

129. As the early melted Earth cooled, the bubbling lava emitted volcanic gasses which collected around the Earth to form the Earth’s atmosphere.
   • True  • False

130. More than 5BYA, the early accreting Earth melted from the forces of gravitational compression and the Earth has been cooling and solidifying ever since.
   • True  • False

131. The Earth’s early crust was sialic continental highlands and mafic ocean floor lowlands.
   • True  • False

132. During the Earth’s early cooling, the mafic hi-density minerals crystallized first and sank towards the center to form the Earth’s core.
   • True  • False

133. As the Earth has cooled and solidified over the past 5BY, the only major layer of the Earth which has not solidified is the
134. **For each of the following, identify the plate tectonic environment (setting):**

- Hawaii
- Himalayas
- Mid-Oceanic Ridge
- San Andreas Fault
- Iceland
- Marianas Islands/Trench
- Aleutian Islands/Trench
- Mid-Atlantic Ridge
- Red Sea
- Java Trench
- Andes Mountains
- East Pacific Rise
- Japan Islands/Trench
- Surtsey
- Emperor Seamount Chain
- Gulf of California
- Appalachians
- Cascade Range
135. Fill in the chart below with a "YES" or "NO"

<table>
<thead>
<tr>
<th></th>
<th>divergent</th>
<th>convergent</th>
<th>transform</th>
<th>hot spot</th>
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<tr>
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