Dynamic Planet
Division C
Mentor Invitational 2017

All answers must be recorded on the included answer sheet.

School:
Team #:
Names:

1-10 Matching (a-k)

1. A lithospheric plate boundary where adjacent plates diverge
2. A condition of equilibrium, similar to buoyancy, by which Earth's brittle crust floats on the plastic mantle
3. An arc-shaped row of volcanoes directly above a subduction zone.
4. A fault characteristic of mid-ocean ridges along which they are offset
5. A fraction or fraction zone in Earth's crust along which displacement occurred
6. A continental margin marked by a high degree of tectonic activity
7. A rising column of magma from the Earth's mantle
8. A movement of two plates in the opposite direction such as along a divergent plate boundary
9. The top layer of the Earth
10. The process by which one lithospheric plate descends beneath another as they converge

11-20 Matching (l-v)

11. A sudden motion of trembling in Earth caused by the sudden release of slowly accumulated strain by faulting or volcanic activity
12. A crustal block bounded on both sides by faults
13. A deep fracture or break extending along a crest of the mid-ocean ridge
14. A plastic layer of the upper mantle 80-200 km deep that may allow lateral movement of lithospheric plates and isostatic adjustments
15. An ancient supercontinent of the geologic past that contained all of Earth's continents
16. A continental margin that lacks a plate boundary and is marked by a region of low degree of tectonic activity
17. A term applied to early theories supporting the possibility the continents are in motion over the Earth's surface
18. The middle region of Earth below the asthenosphere but above the core
19. The property of a substance to offer resistance to flow caused by internal friction
20. Fluid rock material from which igneous rocks form

a) Active Margin
b) Crust
c) Divergent Plate Boundary
d) Fault
e) Isostasy
f) Mantle Plume
g) Rifting
h) Subduction
j) Transform Fault
k) Volcanic Arc
l) Asthenosphere
m) Continental Drift
n) Earthquake
o) Fault Block
p) Magma
q) Mesosphere
r) Pangea
s) Passive Margin
t) Rift Valley
v) Viscosity

Fill in the Blank:

21. Who is seen as the founder of modern stratigraphy?

22. Who created the theory of Uniformitarianism?

23. Who is considered by many to have created the theory of continental drift?

24. Who pioneered the use of radiometric dating of minerals and thermal implications of mantle convection?

25. Who is best known for his theories on sea floor spreading and island arcs?

26. Who started his work with mantle convection and is still currently living today?

27. Who is best known for his work on deep focus earthquakes and how they are associated with subduction zones?

28. Who first suggested that the continents might have once fit together?

29. Who came up with the ideas of the supercontinents Gondwana and Laurasia?

30. Who was the first person to successfully show the validity of continental drift in a paper?

31. What is the process by which the slow moving solid silicate mantle moves?

32. What is a local column of hot magma rising by convection in the mantle?

33. What is the cyclical opening and closing of the Earth's crust caused by movements in the plates?

34. What is a region with a distinctive stratigraphy, structure, and geological history?

35. What is developed when a continental plate is pushed upwards to form mountains?

36. What is a failed arm of a triple junction of a plate tectonics rift system?

37. What are volcanic regions fed by underlying mantle?

38. What is the term for the solid Earth deformation associated with changes in ice-masses?

39. What is the measure of land elevation relative to sea level?

40. What is the underwater equivalent of hypsometry?

41. What is the sudden fall or earth or rock from a mountain or cliff?

42. What does the melting of the lithosphere create as subduction occurs?

43. What is the area that is comprised of a high amount of earthquakes where dense oceanic lithosphere moving in one direction collides with a plate moving in the opposite direction and one of these plates subducts beneath the other?

44. The Pacific plate is sliding past the North American plate. In 10 million years, the plate will move 500km. What is the Pacific plates rate of motion in centimeters per year?

45. What is the boundary between the Earth's crust and mantle?

46. What is the electromagnetic field created in the Earth's core which is fueled by convective flow?

47. What is the deepest known point in the ocean?

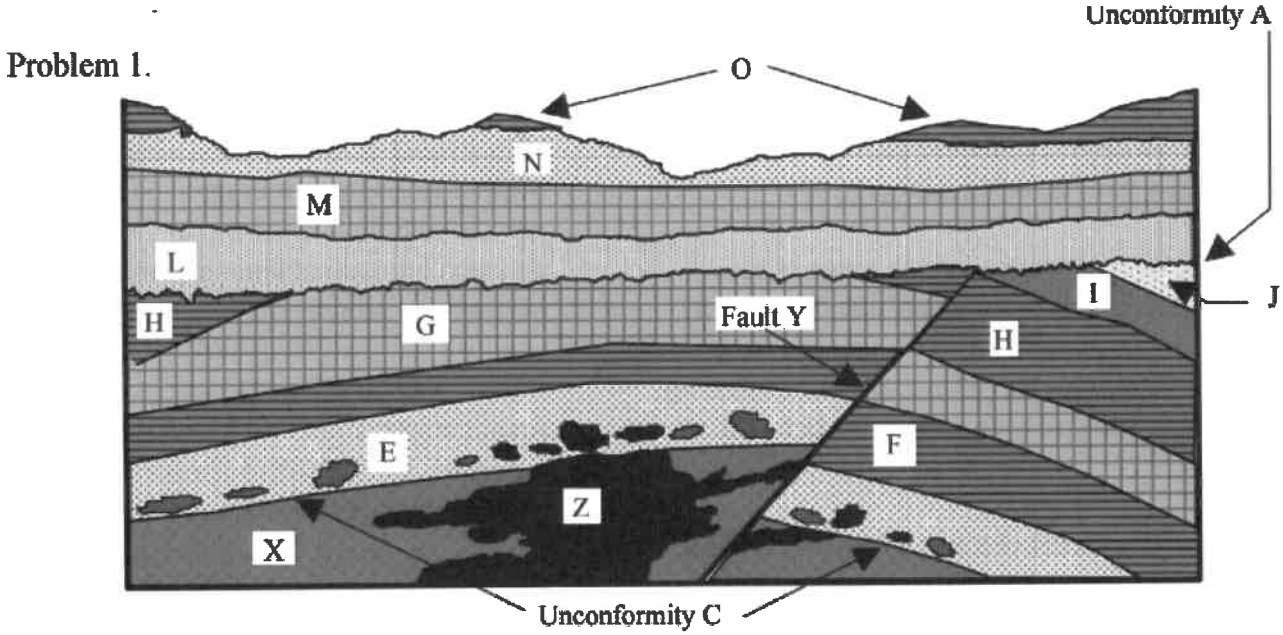
48. What is the highly volcanic boundary around the Pacific plate?

49. Which two of the following volcanoes are located along divergent boundaries?

a. Katmai
b. Hekla
c. Ol Doinyo
d. El Misti
e. Erta Ale

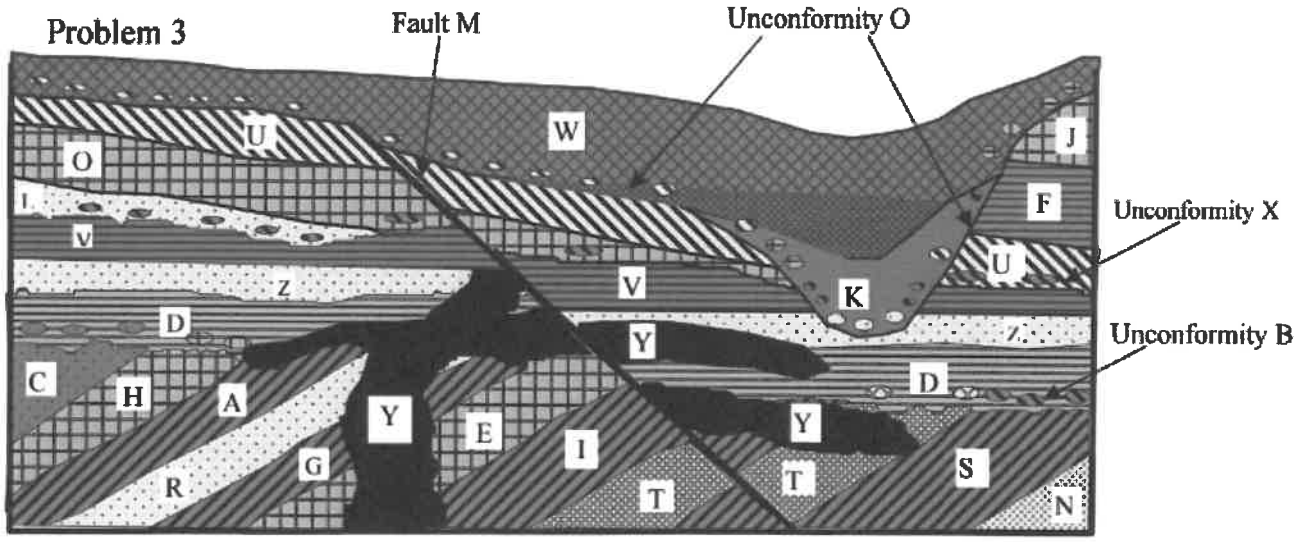
50. Which two of the following volcanoes are located in the middle of a continent?
a. Mauna Loa
b. Katmai
c. Tambora
d. Falcon
e. Ruapehu

Use the map below to give the order of events asked and answer any following questions.



51. _____ Deposition of L and M
52. _____ Deposition of N and O
53. _____ Deposition of E, F and G
54. _____ Deposition of H, I and J
55. _____ Intrusion of granite X
56. _____ Intrusion of basalt Z
57. a. _____ Unconformity A
b. Type _____
58. a.. _____ Unconformity C
b. Type _____
59. _____ Erosion to present surface
60. a. _____ Fault Y
b.Type _____
61. a. _____ Folding of X through J
b. Type _____

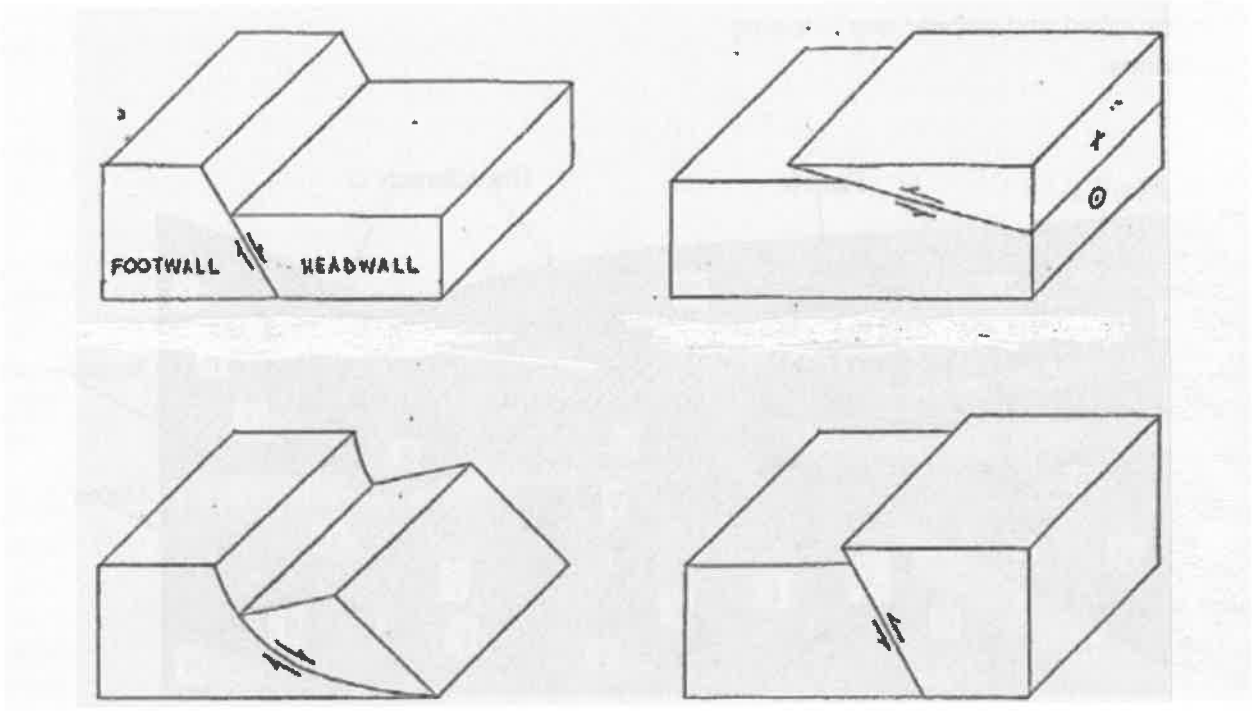
Use the map below to give the order of events asked and answer any following questions.



62. _____ Deposition of K and W
63. _____ Deposition of N, S T and I
64. _____ Deposition of E, G, R, A H and C
65. _____ Deposition of D, Z and V
66. _____ Deposition of L, O, U, F and J
67. _____ Folding of layers N through C

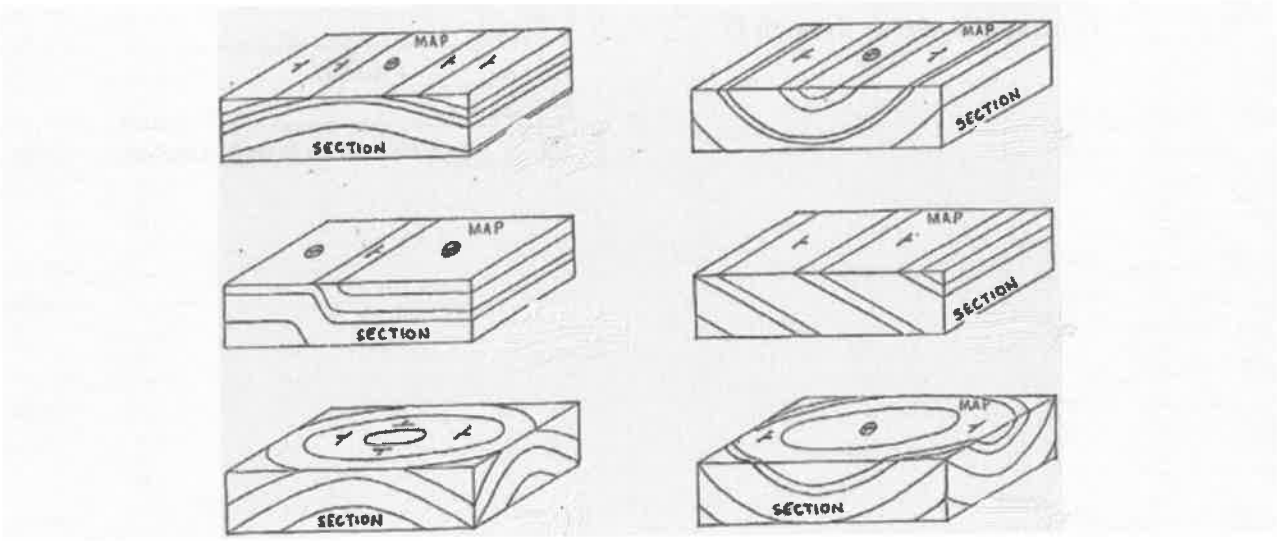
68. a. _____ Unconformity B
b.Type _____
69. a._____ Unconformity X
b.Type_____
70. a. _____ Unconformity O
b.Type_____
71. a._____ Fault M
b.Type_____
72. _____ Erosion to present surface

For questions 73-76, write the type of fault each diagram is.



73 (Top Left).
74 (Top Right).
75 (Bottom Left).
76 (Bottom Right).

For questions 77-82, write the type of fold.



77 (Top Left).
78 (Top Right).
79. (Middle Left).
80. (Middle Right).
81. (Bottom Left).
82. (Bottom Right).

Short answer

83. What is isostasy?

84. A plate's isostatic equilibrium depends on what two characteristics of that plate? [2 pts]

85. _____ is when the Earth's crust rises to its original depth after being depressed by the weight of other crust or glaciers.

86. What is the difference between the hypocenter and epicenter of an earthquake? [2 pts]

87. State several problems associated with ash fallout caused by the 1980 eruption of Mount St. Helens. [3 pts]

88. Now, describe several positive impacts of volcanic activity. [3 pts]

89. Based on the Richter scale for measuring earthquakes, how much more intense is a 9.0-magnitude earthquake than a 6.0-magnitude one? [1 pt]

90. Based on the moment-magnitude scale for measuring earthquakes, how much more energy is released in a 9.0-magnitude earthquake than a 6.0-magnitude one? [1 pt]

Score ____/106
Placing: ____

Dynamic Planet
Division C
Mentor Invitational 2017

School:
Team #:
Names:

Team Number & Name_____

Total Pts. _____ / 106

Matching 1-11

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Matching 11-20

11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Fill in the Blank

21. _____
22. _____
23. _____
24. _____
25. _____
26. _____

(Page 1 pts ____)

(Page 2 pts ____)

(Page 3 pts ____)

27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____
42. _____
43. _____
44. _____
45. _____
46. _____
47. _____
48. _____
49. a._____

    b. _____

50. a._____

    B._____

Page 1 Pts. _____ / 52

Map Problem 1

51. _____

52. _____

53. _____

54. _____

55. _____

56. _____

57. a. _____

b. _____

58. a. _____

b. _____

59. _____

60. a. _____

b. _____

61. a. _____

b. _____

Map Problem 3

62. _____

63. _____

64. _____

65. _____

66. _____

67. _____

68. a. _____

b. _____

69. a. _____

b. _____

70. a. _____

b. _____

71. a. _____

b. _____

72. _____

Fill in the blank

73. _____

74. _____

75. _____

76. _____

77. _____

78. _____

79. _____

80. _____

81. _____

82. _____

83. [1pt.]

84. [2pt.]

85. [1pt.]

86. [2pt.]

87. [3pt.]

88. [3pt.]

89. [1pt.]

90. [1pt.]