**Review for Fall Final Exam 2017**

**Fall Semester Final on Mountain Building ONLY …….**

**The FINAL will be 100 questions and come from this bank - Please forgive spelling errors ☺**

**True/False**

*Indicate whether the statement is true or false.*

\_\_\_\_ 1. Normal faults indicate compressional forces are at work; while reverse faults result from tensional forces.

\_\_\_\_ 2. The East Coast of the United States is a present-day example of an inactive continental margin.

\_\_\_\_ 3. The largest and most complex mountain systems are classified as fault-block mountains.

\_\_\_\_ 4. The Cascade Range of Washington and Oregon is a good example of an upward (domal) mountain chain.

\_\_\_\_ 5. When a fault has both vertical and horizontal movement, it is referred to as an oblique-slip fault.

\_\_\_\_ 6. In northern Canada where there was the greatest accumulation of glacial ice, the weight of the ice actually caused downwarping of the crust.

\_\_\_\_ 7. When rock deforms plastically, it ruptures.

\_\_\_\_ 8. The Himalaya Mountains are thought to have resulted from continental collision.

\_\_\_\_ 9. The deposition of sediments at an inactive continental margin is one of the last steps in the mountain building process.

\_\_\_\_ 10. There appears to be little connection between the theory of plate tectonics and current explanations of orogenesis.

\_\_\_\_ 11. Numerous wave-cut terraces in southern California indicate that this area has experienced uplifting in the past few million years.

\_\_\_\_ 12. In an eroded anticline the youngest rock layers are found near the axis.

\_\_\_\_ 13. According to the plate tectonics theory, the world’s largest mountain systems (e.g.the Appalachians) were produced along divergent plate boundaries.

**Modified True/False**

*Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.*

\_\_\_\_ 14. As erosion lowers the peaks of mountains, isostatic adjustment gradually ***lowers*** the mountains in response.

\_\_\_\_ 15. At high temperatures and pressures, most rocks deform ***plastically*** once their elastic limit is surpassed.

\_\_\_\_ 16. The first encompassing explanation of orogenesis came as part of the ***plate-tectonics***theory.

\_\_\_\_ 17. ***Joints*** are fractures in rock along which appreciable displacement has occurred.

\_\_\_\_ 18. The rock in a fault that is higher than the fault surface is referred to as the ***hanging***wall.

\_\_\_\_ 19. Strike-slip faults that are associated with plate boundaries are called ***transform*** faults.

\_\_\_\_ 20. Under surface conditions, rocks that exceed their elastic limit will behave like a brittle solid and ***fracture.***

\_\_\_\_ 21. Most mountain building occurs in ***tensional*** environments.

\_\_\_\_ 22. The crustal thickness for some mountain chains is greater than ***twice*** the average thickness of the continental crust.

\_\_\_\_ 23. Where the axis of an anticline descends to the ground, the fold is said to be***plunging***.

\_\_\_\_ 24. In large basins that contain sedimentary rock sloping at low angles, the ***oldest*** rocks are found near the center of the structure.

\_\_\_\_ 25. When stress is applied, rocks first respond by deforming ***plastically*.**

\_\_\_\_ 26. Faults in which the movement is primarily ***horizontal*** are called dip-slip faults.

\_\_\_\_ 27. In a plunging ***anticline***, the outcrop pattern “points” in the direction of the plunge.

\_\_\_\_ 28. Wavelike undulations of sedimentary and volcanic rocks are called ***grabens****.*

\_\_\_\_ 29. ***Aleutian-type*** subduction zones occur where two oceanic plates converge.

\_\_\_\_ 30. In a normal fault, the hanging wall moves ***downward*** relative to the foot wall.

\_\_\_\_ 31. Most folds result from ***compressional*** stresses in the crust.

\_\_\_\_ 32. Most major mountain belts are ***fault-block*** mountains.

\_\_\_\_ 33. The two most common types of folds are anticlines and ***haloclines*.**

\_\_\_\_ 34. In a reverse fault, the foot-wall moves ***upward*** relative to the hanging wall.

\_\_\_\_ 35. The ***Appalachians*** resulted from collisions between North America, Europe and northern Africa.

\_\_\_\_ 36. ***Normal*** faulting is often the type that occurs at spreading centers, where plates are diverging.

\_\_\_\_ 37. Most major episodes of mountain building have occurred along ***divergent*** plate boundaries.

\_\_\_\_ 38. ***Fault-block*** mountains are common in the Basin and Range Province of the southwestern United States.

\_\_\_\_ 39. ***Terrane*** refers to any crustal fragment whose geologic history is distinct from that of adjoining fragments.

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

\_\_\_\_ 40. Orogenesis is a

|  |  |
| --- | --- |
| a. | theory that explains the formation of oblique faults |
| b. | mountain range in Asia |
| c. | general term for the processes that produce mountains |
| d. | type of asymmetrical anticline |

\_\_\_\_ 41. In mountainous regions, the

|  |  |
| --- | --- |
| a. | Earth’s crust is thicker than average |
| b. | Earth’s crust is thinner than average |
| c. | thickness of the crust is the same as other areas of the continent |
| d. | crust varies between being thicker and sometimes thinner than the average |

\_\_\_\_ 42. As erosion removes the tops of mountains, the mountains will buoy upward. This is an example of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | orographic uplift | d. | geosynclinal development |
| b. | isostatic adjustment | e. | gravity sliding |
| c. | normal faulting |

\_\_\_\_ 43. When the rock above a fault plane moves down relative to the rock below, a \_\_\_ fault has occurred.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | reverse | c. | transform |
| b. | strike-slip | d. | normal |

\_\_\_\_ 44. Strike-slip faults

|  |  |  |  |
| --- | --- | --- | --- |
| a. | have mainly horizontal movement | c. | are low-angle reverse faults |
| b. | have mainly vertical movement | d. | are faults where no movement has yet occurred |

\_\_\_\_ 45. Once the elastic limit of rock is surpassed

|  |  |
| --- | --- |
| a. | the rock may rupture |
| b. | the rock may deform plastically |
| c. | an earthquake may occur |
| d. | the rock may rupture *and* the rock may deform plastically |
| e. | all of these |

\_\_\_\_ 46. The Great Rift Valley of East Africa is an excellent example of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | horsts and grabens | d. | a symmetrical anticline |
| b. | a plunging syncline | e. | thrust faulting |
| c. | strike-slip faulting |

\_\_\_\_ 47. If erosion stripped the top off a dome, one would find

|  |  |
| --- | --- |
| a. | the oldest rocks were exposed at the center |
| b. | the youngest rocks were exposed at the center |
| c. | a linear pattern of outcropping rock layers |
| d. | oldest rocks were exposed at the center *and* a linear pattern of outcropping rock layer |
| e. | none of these |

\_\_\_\_ 48. The Alps, Urals, and Appalachians are all examples of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | fault block mountains | d. | domed mountains |
| b. | volcanic mountains | e. | none of these |
| c. | folded mountains |

\_\_\_\_ 49. The mountains of the Basin and Range Province are examples of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | fault block mountain | d. | domed mountains |
| b. | volcanic mountains | e. | none of these |
| c. | folded mountains |

\_\_\_\_ 50. The mountains of the Teton Range of Wyoming are examples of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | fault block mountains | d. | domed mountains |
| b. | volcanic mountains | e. | none of these |
| c. | folded mountains |

\_\_\_\_ 51. When the rock above a fault plane moves upward relative to the rock below, what kind of fault has occurred?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | reverse | d. | normal |
| b. | strike-slip | e. | none of these |
| c. | transform |

\_\_\_\_ 52. The Black Hills of South Dakota are a good example of a(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | anticline | d. | dome |
| b. | syncline | e. | monocline |
| c. | basin |

\_\_\_\_ 53. Linear upfolded structures with the oldest strata in the center are termed

|  |  |  |  |
| --- | --- | --- | --- |
| a. | anticlines | d. | domes |
| b. | synclines | e. | monoclines |
| c. | basins |

\_\_\_\_ 54. Linear downfolded structures with the youngest strata in the center are called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | anticlines | d. | domes |
| b. | synclines | e. | monoclines |
| c. | basins |

\_\_\_\_ 55. Large circular downwarped structures, like those found in Michigan and Illinois, are referred to as

|  |  |  |  |
| --- | --- | --- | --- |
| a. | anticlines | d. | domes |
| b. | synclines | e. | monoclines |
| c. | basins |

\_\_\_\_ 56. Faults having primarily vertical movement are called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | strike-slip | d. | dip-slip |
| b. | transform | e. | vertical |
| c. | oblique-slip |

\_\_\_\_ 57. Faults having primarily horizontal movement are called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | strike-slip | d. | dip-slip |
| b. | normal | e. | down |
| c. | oblique-slip |

\_\_\_\_ 58. The San Andreas fault is an example of a/(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | strike-slip | d. | dip-slip |
| b. | normal | e. | overturned |
| c. | oblique-slip |

\_\_\_\_ 59. A low angle reverse fault is referred to as a(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal | d. | compressional  |
| b. | oblique | e. | strike-slip |
| c. | thrust |

\_\_\_\_ 60. A graben is bounded by \_\_\_ faults.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal | d. | compressional |
| b. | oblique | e. | strike-slip |
| c. | thrust |

\_\_\_\_ 61. Which of the following combinations should favor folding rather than faulting?

|  |  |
| --- | --- |
| a. | high temperature and low confining pressure |
| b. | low temperature and low confining pressure |
| c. | low temperature and high confining pressure  |
| d. | high temperature and high confining pressure |

\_\_\_\_ 62. Tensional forces normally cause which of the following?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | strike-slip faults | d. | thrust faults |
| b. | reverse faults | e. | recumbent faults |
| c. | normal faults |

\_\_\_\_ 63. Compressional stress can result in the formation of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | thrust faults | d. | horsts and grabens |
| b. | reverse faults | e. | thrust faults *and* reverse faults |
| c. | rift valleys |

\_\_\_\_ 64. Which of the following is considered evidence that Earth’s outer layer tries to maintain isostatic balance?

|  |  |
| --- | --- |
| a. | subsidence in Long Island following water withdrawal |
| b. | uplift of portions of North America following the melting of glacial ice |
| c. | changes in the level of the Mediterranean Sea |
| d. | the formation of Niagra Falls |

\_\_\_\_ 65. The Appalachian Mountains are thought to be the result of

|  |  |
| --- | --- |
| a. | rifting along the Mid-Atlantic ridge |
| b. | a continental collision between Africa and North America |
| c. | extensive hot spot activity |
| d. | folding caused by broad uplifting in the Great Plains region |
| e. | extensive volcanism during the Precambrian |

\_\_\_\_ 66. Which one of the following is NOT a form of rock deformation?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | elasticty | c. | fracturing |
| b. | plasticity | d. | erosion |

\_\_\_\_ 67. The thickest part of the crust occurs in

|  |  |  |  |
| --- | --- | --- | --- |
| a. | the asthenosphere | d. | eastern Canada |
| b. | the ocean basin | e. | old eroded mountains |
| c. | young mountain ranges |

\_\_\_\_ 68. In the Gulf coastal plain region of the United States important accumulations of oil occur in association with geologic structures called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal faults | d. | ocean trenches |
| b. | parallel joints | e. | salt domes |
| c. | hot spots |

\_\_\_\_ 69. The two most common types of folds are anticlines and

|  |  |  |  |
| --- | --- | --- | --- |
| a. | domes | d. | superclines |
| b. | synclines | e. | batholiths |
| c. | basins |

\_\_\_\_ 70. Compared to the elevation of a thin piece of continental crust, the highest elevation of a thick piece in isostatic balance will be

|  |  |  |  |
| --- | --- | --- | --- |
| a. | higher | d. | overturned |
| b. | the same | e. | older |
| c. | lower |

\_\_\_\_ 71. Orogenesis refers to those processes that collectively produce

|  |  |  |  |
| --- | --- | --- | --- |
| a. | a mountain system | d. |  trenches |
| b. | earthquakes | e. | subduction zones |
| c. | oceanic plates |

\_\_\_\_ 72. A fracture with horizontal displacement parallel to its surface trend is called a(n) \_\_\_ fault.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | dip-slip | d. | oblique-slip |
| b. | jointed | e. | overturned |
| c. | strike-slip |

\_\_\_\_ 73. The rock immediately above a fault surface is commonly called the

|  |  |  |  |
| --- | --- | --- | --- |
| a. | anticline | d. | hanging wall |
| b. | foot-wall | e. | dip-slip |
| c. | syncline |

\_\_\_\_ 74. The removal of material by erosion will cause the crust to

|  |  |  |  |
| --- | --- | --- | --- |
| a. | subduct | d. | subside |
| b. | rise | e. | thicken |
| c. | old |

\_\_\_\_ 75. Folding is usually the result of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | tensional forces | d. | jointing |
| b. | shear forces | e. | compressional forces |
| c. | faulting |

\_\_\_\_ 76. As heat and pressure increase, plastic deformation

|  |  |  |  |
| --- | --- | --- | --- |
| a. | stops occurring | d. | can cause erosion |
| b. | becomes less likely | e. | becomes more likely |
| c. | is replaced by elastic deformation |

\_\_\_\_ 77. Which one of the following pairs is properly matched?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal fault - tensional stress | c. | reverse fault - tensional stress |
| b. | thrust fault - tensional stress | d. | normal fault - compressional stress |

\_\_\_\_ 78. The total accumulated displacement from earthquakes and creep along the San Andreas fault system is approximately

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 120 kilometers | d. | 452 kilometers |
| b. | 255 kilometers | e. | 560 kilometers  |
| c. | 380 kilometers |

\_\_\_\_ 79. Where two oceanic plates converge, \_\_\_ subduction zones often occur.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Andean-type | d. | Aleutian-type |
| b. | Himalayan-type | e. | Arctic-type |
| c. | American-type |

\_\_\_\_ 80. Which one of the following features is formed by crustal upwarping?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | syncline | d. | graben |
| b. | basin | e. | accretionary wedge |
| c. | anticline |

\_\_\_\_ 81. The most important difference between faults and joints is that joints

|  |  |  |  |
| --- | --- | --- | --- |
| a. | occur along folds | d. | are usually vertical |
| b. | are often parallel | e. | are very rare |
| c. | have no displacement |

\_\_\_\_ 82. The period of deformation known as the Laramide Orogeny that produced a portion of the Rocky Mountains peaked about \_\_\_ million years ago.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a. | 10 | b. | 20 | c. | 40 | d. | 60 | e. | 80 |

\_\_\_\_ 83. It is assumed that many of the terranes found in the North American Cordillera were once crustal fragments scattered throughout the eastern \_\_\_ ocean basin.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Pacific | c. | Idian |
| b. | Atlantic | d. | Arctic |

\_\_\_\_ 84. The San Andreas fault system is a well-known example of a(n) \_\_\_ fault.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal | d. | reverse |
| b. | transform | e. | overturned |
| c. | thrust |

\_\_\_\_ 85. Faults where the movement is primarily vertical are called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | transform | d. | random |
| b. | oblique | e. | strike-slip |
| c. | dip-slip |

\_\_\_\_ 86. The collision and joining of crustal fragments to a continent is called continental

|  |  |  |  |
| --- | --- | --- | --- |
| a. | subduction | d. | suturing |
| b. | isostasy | e. | aggradation |
| c. | accretion |

\_\_\_\_ 87. Dip-slip faults are classified as \_\_\_ faults when the hanging wall moves up relative to the footwall.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | normal | d. | tensional  |
| b. | transorm | e. | strike-slip |
| c. | reverse |

\_\_\_\_ 88. The \_\_\_ Mountains are primarily a volcanic arc produced by a subducting plate.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Himalaya | d. | Ural |
| b. | Andes | e. | Appalachian |
| c. | Adirondacks |

\_\_\_\_ 89. Which one of the following mountain ranges has formed where continental crusts have converged?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Sierra Nevada | c. | Himalaya Mountains |
| b. | Andes Mountains | d. | Coast Ranges |

**Completion**

*Complete each statement.*

 90. The geologic term used for the combined processes that generate mountains is \_\_\_.

 91. The concept of the lithosphere floating in gravitational balance upon the asthenosphere is called \_\_\_.

 92. When a rock is able to return to its original shape after it has been deformed, it is said to have experienced \_\_\_ deformation.

 93. When a rock is permanently altered through folding and flowing, it is said to have experienced \_\_\_ deformation.

 94. A(n) \_\_\_ fault is one in which the rock above the fault plane moves downward relative to the rock below.

 95. Linear upfolded structures with the oldest strata in the center are known as \_\_\_.

 96. Linear downfolded structures with the youngest strata in the center are called \_\_\_.

 97. Large circular downwarped structures, like those found in Michigan and Illinois, are referred to as \_\_\_.

 98. The Black Hills are an excellent example of a nearly circular upwarped structure called a(n) \_\_\_.

 99. The general name of a group of faults that have primarily horizontal movement is \_\_\_.

 100. The general name of a group of faults that have primarily horizontal momvement is \_\_\_.

 101. Fractures in Earth’s crust along which appreciable movement has taken place are called \_\_\_.

 102. A low angle reverse fault is known as a(n) \_\_\_ fault.

 103. Horsts and grabens are bounded by \_\_\_ faults.

 104. The mountains of the North American Cordillera were produdced in part by the accretion of small crustal blocks to the margin of the continent. These crustal fragments having distinct geologic histories are known as \_\_\_.

 105. In subduction zones, sediments are scraped off the descending oceanic plate and piled up in front of the overriding plate producing a(n) \_\_\_.

**Short Answer**

 106. Why don’t anticlines always appear as hills, even though the rocks beneath the surface are folded upward?

 107. Briefly describe the composition and formation of an accretionary wedge.

 108. Describe the processes responsible for the formation of Earth’s major mountain systems.

 109. What evidence supports the fact that sedimentary rocks found at high elevations in mountains were once below sea level?

 110. Why is the crust beneath the oceans at a lower elevation than the continental crust?

 111. Describe the concept of isostasy.

 112. Explain the events that produce mountains at convergent boundaries where....

 (a) oceanic and continental crusts converge AND

 (b) continental crusts converge

**Other**

 113. When a rock’s shape and size are permanently altered by folding and flowing, the rock has undergone **[*elastic / orogenic / plastic]*** deformation.

 114. Forces that pull apart Earth’s crust are called **[*compressional / tensional]*** stresses.

 115. The concept of a floating crust in gravitational balance is called [***orogenesis / isostasy*].**

 116. A fault with primarily vertical displacement is called a(n) [***dip-slip / strike-slip / oblique-slip*]** fault.

 117. Reverse faults are usually produced by [***tensional / compressional*]** forces.

 118. Changes in elevation caused by the addition or removal of weight from Earth’s crust are called [***isostatic / volcanic / orogenic***] adjustments.

 119. Fault-block mountains are associated with [***compressional / tensional****]* forces.

 120. Volcanic arcs are associated with [***diverging / subducting***] tectonic plates.

 121. Troughs or downfolds in rock are called [***anticlines / synclines***].

 122. Most mountain building is associated with the [***margins / central regions***] of tectonic plates.

 123. Grabens and horsts are associated with regions of tectonic plate [***convergence / divergence***].

 124. Continental crust is [***more / less****]* dense than oceanic crust.

 125. Over time, erosion and isostatic adjustments will *[****bury / expose***] a mountain’s core.

 126. The central regions of upwarped mountains are usually composed of metamorphic and [***sedimentary / igneous***] rocks.