

You will need a scantron form to answer the 21 multiple-choice questions. The relative age dating exercise for problem A and B will be hand graded. Fill out the name and WSU ID area of both the scantron and assignment sheet.

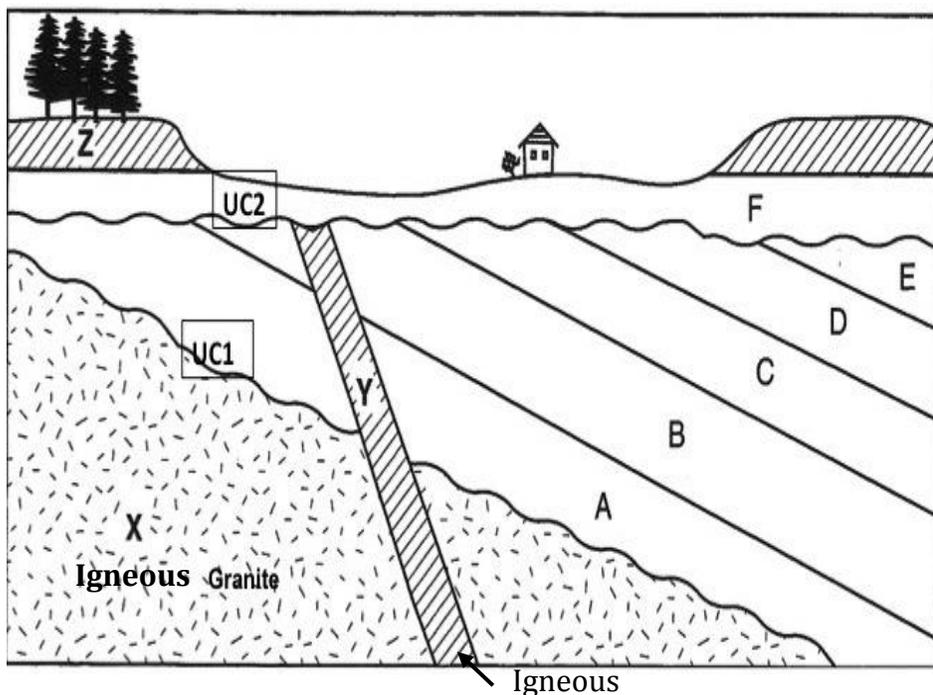
Hand in both the scantron and the assignment sheet before the exam on Thursday, March 8. Homework turned in after the start of the exam will lose points and homework at the end of the class will be considered late. **Homework on a separate sheet of paper will not be accepted for this assignment because you need both a scantron and this sheet.** All multiple-choice questions are worth 0.5pts each. All rock units are sedimentary unless otherwise noted.

**KEY**

All rocks are sedimentary unless otherwise noted

Hint: There is a worked example on the course web page for you to review. [www.wsu.edu/~geology101/sec1](http://www.wsu.edu/~geology101/sec1)  
On a separate piece of paper first determine the complete order of events from oldest (bottom) to youngest (top) before you label the events below.

Problem A Cross Section: (total 7 points)

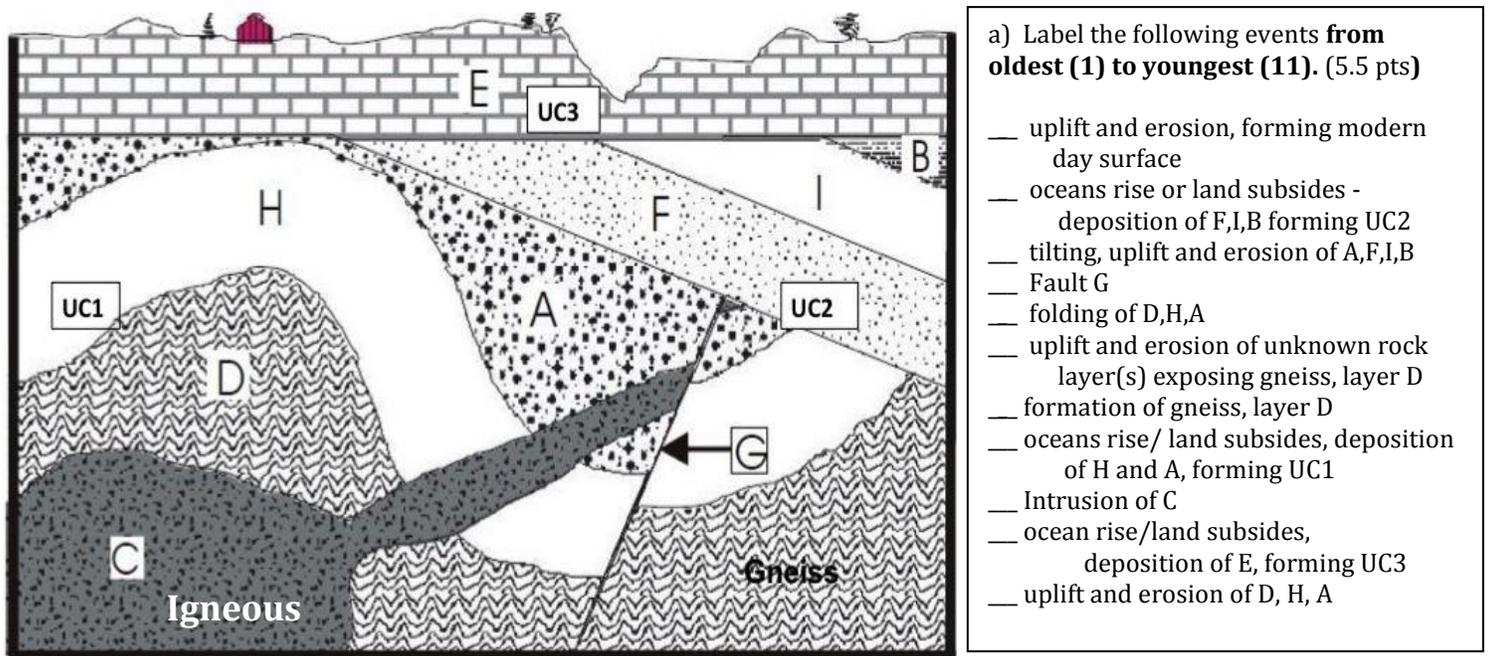


- a) Label the following events **from oldest (1) to youngest (7)** (3.5pts)
- \_\_\_ oceans rise or land subsides and deposition of units A,B,C,D,E forming UC1
  - \_\_\_ Intrusion Y
  - \_\_\_ oceans rise or land subsides, deposition of F,Z forming unconformity UC2
  - \_\_\_ Intrusion of X into unknown rock
  - \_\_\_ uplift and erosion of F and Z forming modern day surface
  - \_\_\_ uplift and erosion of unknown rock type exposing igneous unit X
  - \_\_\_ uplift, tilting and erosion of units A,B,C,D,E and Y

- 1) How can we tell the age of intrusion X relative to the age of intrusion Y? By using which principle? (0.5pt)
  - a) intrusion X is older; principle of cross cutting relationships
  - b) intrusion X is older; principle of superposition
  - c) intrusion X is younger; principle of cross cutting relationships
  - d) intrusion Y is younger; principle of superposition
- 2) What type of unconformity (UC1) is present between Intrusion X and Layer A? (0.5 pt)
  - a) angular unconformity    b) non conformity    c) disconformity
- 3) What type of unconformity (UC2) exists between sedimentary layers A,B,C,D,E and sedimentary layer F? (0.5 pt).
  - a) angular unconformity    b) disconformity    c) non-conformity

- 4) Igneous intrusion "Y" is found cutting across X, A and B forming an igneous rock body called a \_\_\_? (0.5pt)  
 a) batholith      b) pluton      c) sill      d) dike
- 5) Given: Intrusion X contains radioactive isotopes with a known half-life of 83,000,000 years. How many half-lives have elapsed, if for every 50% parent isotope 50% daughter isotopes are found? (0.5 pt)  
 a) 1 half lives      b) 3 half lives      c) 2 half lives      d) 4 half lives
- 6) What is the age of Intrusion X? (0.5pt)  
 a) 249 million years      b) 83 million years      c) 332 million years      d) 166 million years
- 7) In which **geologic time (Era and Period)** was intrusion X formed? (Refer to Geologic Time Scale on page 360 in your lecture text.) (0.5 pt)  
 a) Mesozoic, Cretaceous      b) Mesozoic, Jurassic      c) Paleozoic, Carboniferous      d) Mesozoic, Triassic

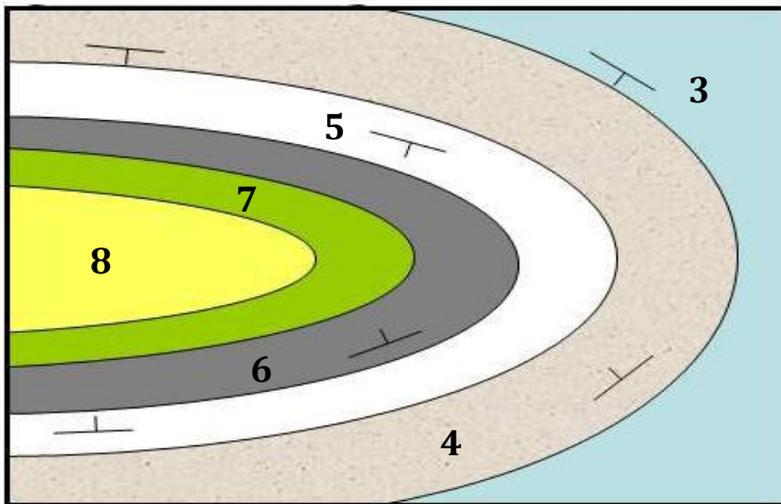
Problem B Cross Section: (total 9.5 points)



- 8) What type of unconformity (UC1) exists between sedimentary unit H and layer D (gneiss)? (0.5 pt)  
 a) disconformity      b) nonconformity      c) angular unconformity
- 9) What type of fault (specific type) is fault G? (0.5 pt)  
 a) left lateral strike slip      b) reverse dip slip      c) right lateral strike slip      d) normal dip slip
- 10) What type of stress is associated with fault G? (0.5 pt)  
 a) compression      b) tension      c) ductile (plastic)      d) brittle      e) shear
- 11) Fault G is an example of what type of deformation (strain)? (0.5 pt)  
 a) compression      b) ductile (plastic)      c) tension      d) elastic      e) brittle
- 12) At what type of plate boundary would this type of fault form? (0.5pt)  
 a) divergent      b) convergent      c) transform
- 13) What type of folding of layers D, H, A do you see in the area where label H is located? (0.5pt)  
 a) syncline      b) anticline      c) brittle      d) plastic

- 14) Intrusion C contains rocks with radioactive isotopes, with half life for parent being 350,000,000 years. If there are 1 parent atoms and 7 daughter atoms in the sample now, how old is intrusion A? (0.5 pt)  
 a) 175,000,000 years                      b) 350 million years    c) 700 million years    d) 1,050,000,000 years
- 15) In which **geologic time (Era and Period)** was intrusion A formed? (Refer to Geologic Time Scale on page 360 in your lecture text.) (0.5 pt)  
 a) Mesozoic, Cretaceous                      b) Proterozoic, Mesoproterozoic  
 c) Proterozoic, Neoproterozoic              d) Paleozoic, Mississippian

Problem #C – Map (total 3pts)



Use the figure to answer the following questions. **Bed 3 is the oldest bed and bed 8 is the youngest.**

- 16) The fold axis is \_\_\_\_\_? (0.5pt)  
 a) plunging    b) non-plunging
- 17) This is a map of what type of structure? (0.5pt)  
 a) non-plunging syncline    b) non-plunging anticline    c) plunging syncline    d) plunging anticline
- 18) List the factors that determines the type of structure. (0.5pt)  
 a) the shape of the different layers and the strike and dip symbols  
 b) the age relationship (oldest on the outside, youngest on the inside)  
 c) the age relationship (youngest on the outside, oldest on the inside)  
 d) a and b  
 e) a and c
- 19) This structure results from \_\_\_\_\_ stress. (0.5pt)  
 a) tension    b) ductile (plastic)    c) compression    d) brittle    e) shear
- 20) This type of structure typically forms at \_\_\_\_\_ plate boundaries. (0.5pt)  
 a) convergent    b) divergent    c) transform
- 21) The fold is an example of \_\_\_\_\_ strain? (0.5pt)  
 a) compression    b) elastic    c) tension    d) brittle    e) ductile (plastic)