

NAME:

---

---

**GEOLOGY 340 – SEDIMENTATION AND STRATIGRAPHY**  
*FINAL EXAM*

---

---

- QUESTION 1 \_\_\_\_\_ (15 POINTS)  
QUESTION 2 \_\_\_\_\_ (15 POINTS)  
QUESTION 3 \_\_\_\_\_ (20 POINTS)  
QUESTION 4 \_\_\_\_\_ (15 POINTS)  
QUESTION 5 \_\_\_\_\_ (15 POINTS)  
QUESTION 6 \_\_\_\_\_ (20 POINTS)  
QUESTION 7 \_\_\_\_\_ (15 POINTS) \*EXTRA CREDIT
- 
- 

*ANSWER EACH OF THE FOLLOWING QUESTIONS ON THE PAPER PROVIDED.*

*QUESTION 1 (15 POINTS TOTAL)*

- (a) What is the primary difference between lithostratigraphic and chronostratigraphic methods of correlation. (5 points)
- (b) Describe the methodology (including advantages and disadvantages) of two of the following four methods of chronostratigraphy: (5 points each)
- magnetostratigraphy
  - biostratigraphy
  - strontium isotope stratigraphy
  - oxygen isotope stratigraphy

*QUESTION 2 (15 POINTS TOTAL)*

- (a) Define “accommodation space”. (5 points)
- (b) Why is the concept of changing accommodation space more valid for interpreting the deposition of stratal packages than that of changing sea level? (10 points)

*QUESTION 3 (20 POINTS TOTAL)*

- (a) How would depositional conditions (in terms of sedimentation and available accommodation space) be expected to vary in order to produce progradational, aggradational, and retrogradational stacking of depositional facies. (10 points)
- (b) Discuss the depositional conditions and processes, in both siliciclastic and carbonate successions, that result in the typical “shallowing-upward” (or “progradational” or “regressive”) facies arrangement within parasequences. (10 points)

*QUESTION 4 (15 POINTS TOTAL)*

- (a) Define “eustasy”? (5 points)
- (b) The two major difficulties of determining eustatic sea level changes are measuring eustasy with accuracy and determining the mechanisms of eustatic sea level change. Discuss how each of the following mechanisms may contribute to global eustasy. (5 points each)
- seafloor spreading
  - global climate changes

NAME:

**QUESTION 5 (15 POINTS TOTAL)**

(a) Given three facies – deep marine shale, mid-shelf fine-grained sandstone, and coarse-grained coastal sandstone – sketch and annotate the expected parasequence stacking patterns for the following scenarios (5 points each) \*note: show at least 5 parasequences in each stack

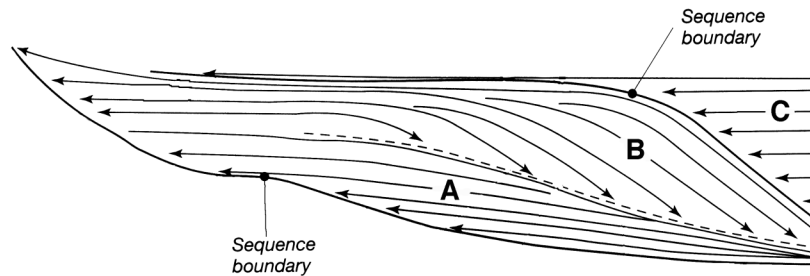
- sea level rise with moderate subsidence rates
- stable sea level and stable subsidence, with high sediment influx
- rapid sealevel fall

**QUESTION 6 (20 POINTS TOTAL)**

(a) Clearly label, on the diagram below, the surfaces at which the following occur (or would be expected to occur). (5 points)

- erosional truncation of underlying strata
- downlap
- onlap

(b) Briefly describe the significance of each of these three surfaces (listed in part “a”) in terms of changes in relative sealevel and the stacking patterns (aggradational, progradational, retrogradational) that you would expect to find. (5 points each)



**QUESTION 7 (FOR A MAXIMUM OF 15 POINTS EXTRA CREDIT)**

(a) For the scenario depicted above, translate the depositional packaging into the following Wheeler diagram, making sure to clearly label the following:

- sediment packages A, B, and C
- periods of non-deposition/erosion
- time of maximum flooding

