SSSS Fossils Test 2015

INSTRUCTIONS

The following questions are divided into 20 stations. Stations vary in length and difficulty. You have 2 minutes and 30 seconds to answer the questions at each station. After time is up, move to the next station. Additional material needed at specific stations will be specified at that station. Tie-breakers are denoted by "TB_".

Points

_____ / 332

Station 1

A

B

C

1. Identify the genus of all three specimen (3 points)

2. Name the three main coral groups. Match each specimen to their respective group (3 points)

3. Specimen C is well known as a special stone. What stone is it known as, and for which state is it the state stone of? (2 points)

4. Specimen B is known for its honey-comb like tubular features. What are these features called? (1 point)

5. Most corals have horizontal and vertical partitions that divide each polyp cavity. What are these partitions called? (2 points)

6. What is the class name of these specimen? (1 point)

7. What is the polyp cavity called? (1 point)

8. Arrange these specimen in order from oldest to youngest, based on the time of their first appearance. (2 points)

Station 2

A

B

C

D

1. Identify the genus of the sponges (2 points)

2. Specimen D has star-shaped structures. What are these called, and what are they made of? (2 points)

3. Which of the following specimen was/were still alive after the Permian period? (2 points)

4. What mode of preservation was Specimen B in? (1 point)

5. The phylum of specimen C has a special feeding structure that makes it similar to another phylum. What is this feeding structure called, and what is the related phylum? (2 points)

6. Specimen D was part of a special class in its phylum that was an important reef builder in prehistoric times. What is this class, and during which two periods was it an important reef builder? (3 points)

7. Sponges are one of the earliest multicellular organisms. However, another fossil group has been discovered as the earliest known complex multicellular organisms. What are they called? (2 points)

8. One class of sponges uses the protein spongin. What is this class? (1 point)

Station 3

A

B

C

1. Identify the specimen that is/are brachiopod(s). (2 points)

2. What is the mineral composition of the shell of specimen B? (1 point)

3. Which of the following specimen is a living fossil? (1 point)

4. Which of the following specimen is/are extinct? (2 points)

5. What is the valve shape of specimen C (Ex: Plano-Convex, Concavo-Convex, etc.)? (2 points)

6. Arrange these specimen from youngest to oldest. (2 points)

7. What is the mode of life of specimen B? (1 point)

8. What mode of preservation is specimen A? (1 point)

9. Organisms in the phylum of specimen C usually have a raised area called a fold on one valve and a depressed area called a sulcus on the other. What are the names of these valves, and which ones have the fold or sulcus? (3 points)

Station 4

A

B

C

D

1. Which specimen does not belong? Identify that specimen. (2 points)

2. What is the mode of preservation of specimen A? (1 point)

3. What mineral is specimen B preserved in? (2 points)

4. Specimen C has special patterns on it. What are these patterns called? Name three types of these patterns. (4 points)

5. Specimen D was found in a bed of strata. What was the age of the strata? What geological principle was used to determine this? (3 points)

6. Which two specimen are the closest related? Identify these specimen. (3 points)

7. Which of the following is an index fossil? For which period? (2 points)

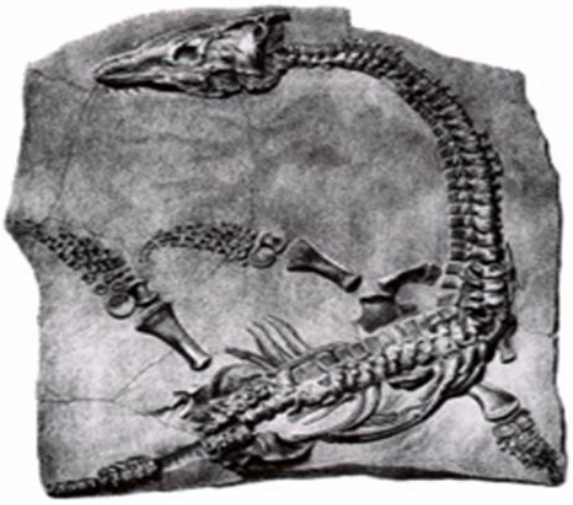
8. Specimen A has a chambered part of its shell. What is this part called? (1 point)

9. Arrange the specimen in order from oldest to youngest based on time of extinction. (3 points)

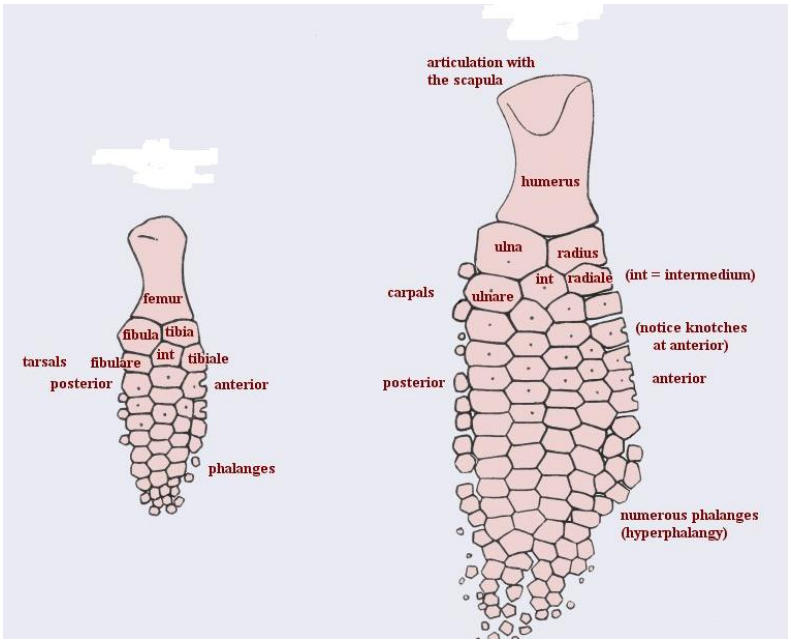
10. For specimen C, how can one tell the difference between a male and female specimen? (3 points) *TB2

Station 5

A



B



C

1. Identify the order of specimens A and B. (2 points)

2. Specimen C is part of specimen A. Which represents a forelimb of specimen A, the left one or the right one? (2 points)

3. The specimens were predators during which era? (1 point)

4. Which specimen died due to a mass extinction event? What was this mass extinction event? (2 points)

5. Specimen B had two main morphological types. Name these two types, and describe each of them. (4 points)

6. The organism of specimen A had a ring of bony plates around its eye sockets. What was this ring called? (2 points)

7. Specimen A is part of the organism that is the state fossil for which state? (1 point)

8. Specimen A evolved to resemble the ancestors of modern day dolphins and whales despite differing ancestors. What is this an example of? (1 point)

Station 6

A

B

C

D

1. All of these specimen are part of which phylum? (1 point)

2. Describe the position specimen A is in. What was the purpose of this position? (2 points)

3. Describe the habitat and mode of life of specimen D. (2 points)

4. What is the class of specimen B? (1 point)

5. Specimen C has elongated extensions on both sides. What is its genus, and what are these extensions called? (2 points)

6. How many eyes did specimen C have? (2 points)

7. Members of the class of specimen A all went extinct due to which extinction event? When did this extinction event occur, in millions of years ago? (2 points)

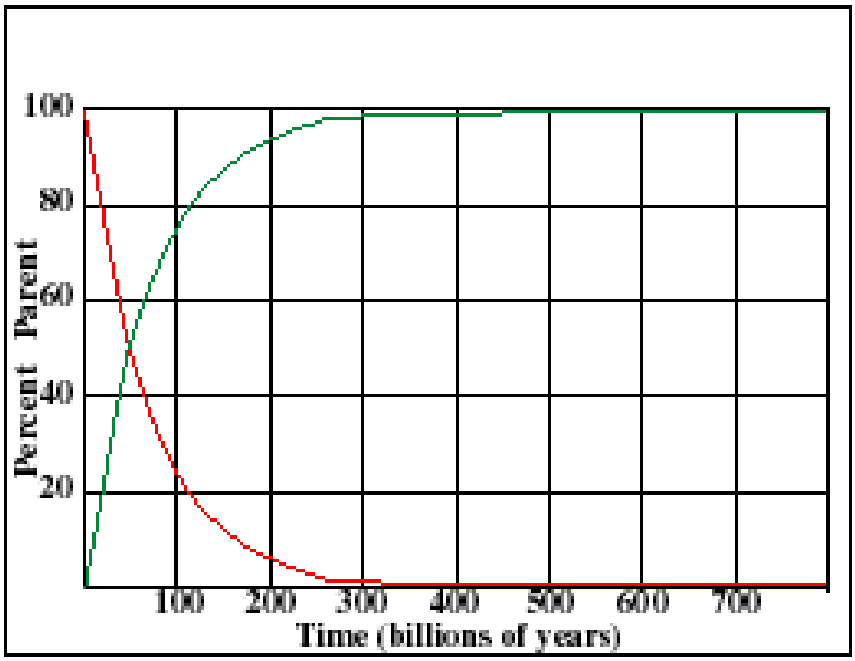
8. Specifically, specimen A had what type of eyes? What were they made of? (3 points)

9. The phylum of these specimen came to be during a great increase in biodiversity and life in which all existing phyla developed. What was this event called? (1 point)

10. Which fossil is the state fossil of Pennsylvania? (1 point)

Station 7

*Calculator would be provided at this station.



1. Approximately what is the half life? (1 point)

2. Based on the half-life, what is the parent element? What is the daughter element? (2 points)

3. After 125 billion years, what percent will be made up of the daughter element (Use the half-life found in question 1 for your calculations)? (2 points)

4. What type of rock is best for radiometric dating? (1 point)

5. Carbon dating is a commonly used dating method. What specific isotope does it use, and what is its half-life? (2 points)

6. What are 2 limitations to carbon dating? (2 points)

7. Who developed radiocarbon dating? (1 point)

Station 8

A

B

C

1. Identify all the specimen. (3 points)

2. What is specimen B mainly composed of? (1 points)

3. Specimen C was part of an organism that became the dominant marine predator of its time due to the decline of which two other organisms? (2 points)

4. What were the periods in which each of the specimen first appeared? (3 points)

5. Based on the structure of specimen A, what was the function of specimen A, and what was the diet of the organism it represents? (3 points)

6. What two continents are specimen C primarily distributed? (2 points)

7. The first publicized discovery of specimen C was found in what famous limestone bed? (2 points)

8. Organisms of specimen A and B are related primarily due to what physical feature? (1 point)

Station 9

A

B

C

D

1. Identify the genus of the specimen. (4 points)

2. What was the most probably purpose of specimen A on the organism? (2 points)

3. Which specimen were carnivores, and which specimen were herbivores? (2 points)

4. In the movie “Jurassic Park”, the name of specimen C was used, but the animal was modeled after a different dinosaur. What was that dinosaur? (2 points)

5. It would have been impossible for these specimen to have hunted each other. Why is that? (1 points)

6. Specimen D has a very conspicuous thumb spike. However, when it was first discovered, the spike was misplaced elsewhere. Where was it misplaced? (1 point)

7. Order these specimen from oldest to youngest, and give the time range that each of these specimen lived, in millions of years ago. (6 points) *TB1

Station 10

1. What are the two types of lagerstatten? Define each type. (4 points)

2. What event similar to the Cambrian Explosion occurred about 575 million years ago with the Ediacara fauna? (2 points) *TB6

3. Certain lagerstatten are known for specific events or extraordinary fossils. What lagerstatten is known for representing the Cambrian Explosion? What lagerstatten is known for containing the famous Archaeopteryx? Where is each of them located? (4 points)

4. What is the significance of Archaeopteryx? (2 points)

5. What geological period does the Mazon Creek fossil bed represent? (1 point)

6. The Yixian lagerstatten is famous for what? (1 point)

7. Give three characteristics of an index fossil. (2 points)

Station 11

A

B

C

1. All of the specimen are what part of the organism? (1 point)

2. Which specimen is the youngest? Identify the specimen. (2 points)

3. Animals of specimen A probably spent most of their lives doing what? (1 point)

4. The last few surviving organisms of specimen A were found on what island? (2 points)

5. Unlike many other fossils, the bones corresponding to specimen A are usually not petrified. Why is this so? (2 points)

6. The mass extinction of animals of specimen C is widely presumed to be due to overexploitation by what group? (2 points)

7. Which famous French naturalist gave specimen C its name? What did he/she name it after? (2 points)

8. The individual in question 7 was also famous for a certain proof. What did he prove? (1 point)

9. How many digits do organisms of specimen B have on their feet? (1 points)

Station 12

A

B

C

D

E

F

1. Identify all the specimen (6 points)

2. Which of the specimen technically isn't actually a dinosaur? (1 point)

3. What are the two orders of dinosaurs? What bodily structure determines the distinction? Which specimen are in each type? (4 points)

4. In the late 1800s, there was a period of intense fossil speculation and discovery between two individuals. What was this period called? Who were the two individuals who competed against each other? Which individual "won" in numbers? (4 points)

5. You can assume that specimen A was most likely of what gender? (1 point)

6. Where were organisms of specimen C mainly distributed? (1 point)

7. What was the species name of the first specimen D discovered in 1877? Who discovered it? (2 point) *TB5

8. Specimen F is the most abundant large predator and has many found specimen in which fossil-bearing rock formation? (1 point)

9. Which dinosaurs* could have lived at the same time? Which geological period did they live in? (4 point)

*Technical definition

Station 13

Write an essay describing the K-Pg extinction event.

Your essay should include when it occurred, the percent of total species that went extinct, its rank in devastation among extinction events, examples of groups that went extinct, the description and evidence for the main theory, and the description of the Deccan Traps theory. (13 points) *TB3

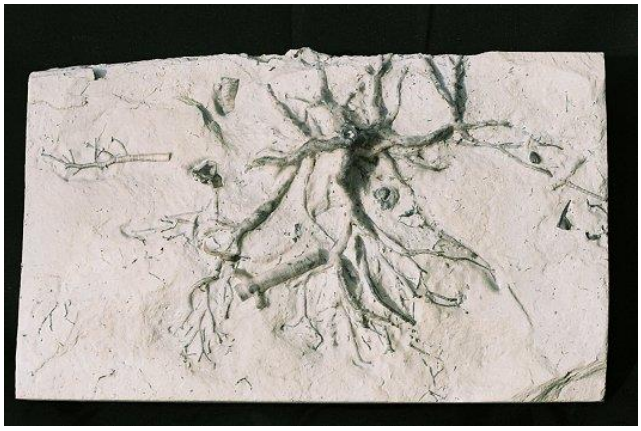
Station 14

A

B

C

D



E

1. Identify the class of specimen A-D (4 points)

2. What part of specimen D is preserved? (1 point)

3. Specimen D has three types of plates. What are these plates called? (3 points)

4. What is the common name for specimen A-C? (3 points)

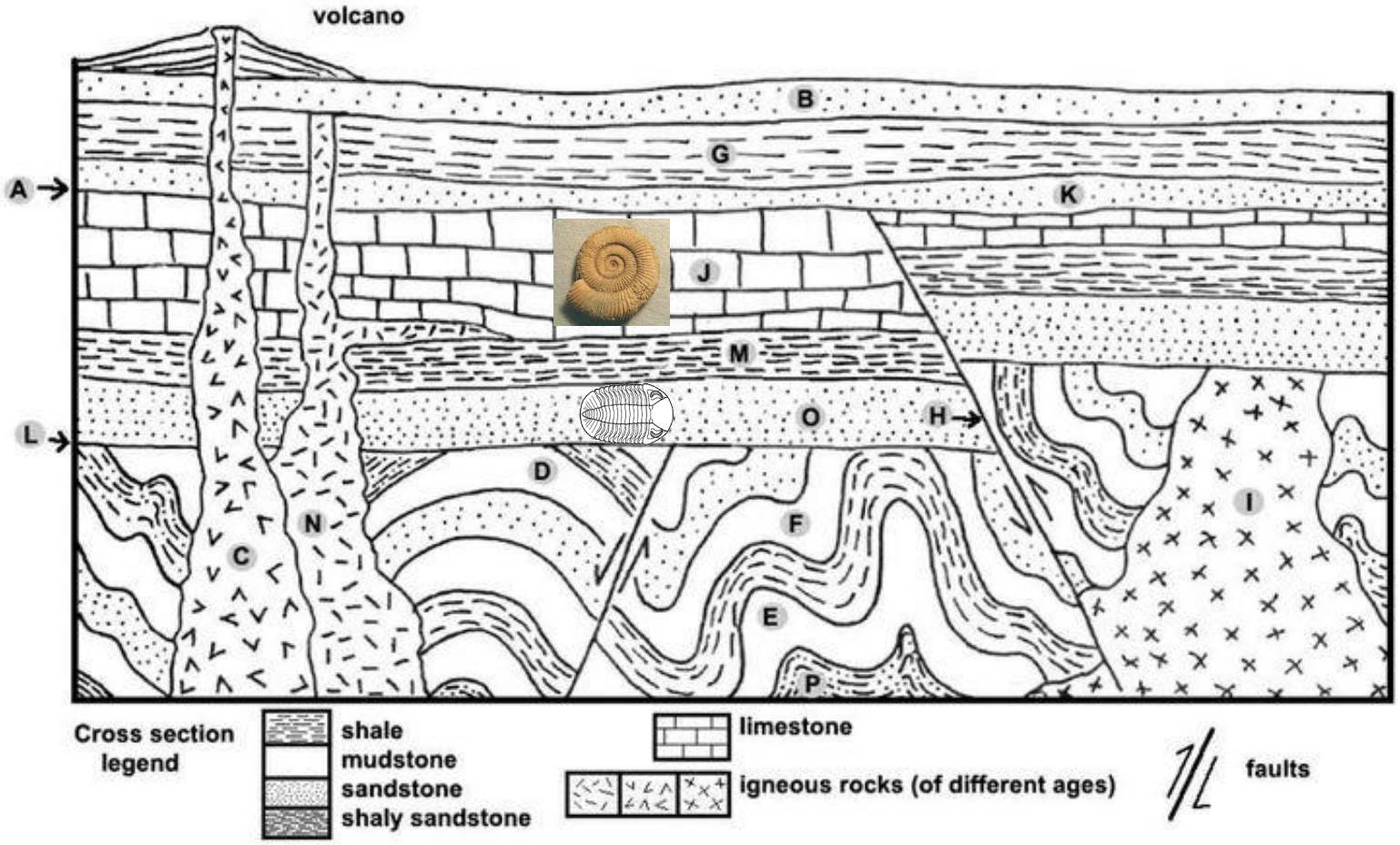
5. What is specimen E called? Which other specimen is part of the same organism as specimen E? (2 points)

6. Specimen C is made up of columns of thin, calcite plates. What are the two types of these plates? (2 points)

7. Specimen A has a stalked and unstalked form. What is it commonly called in its unstalked form? (2 points)

8. Which specimen is/are extinct? (1 point)

Station 15



1. Order the events/letters in order from youngest to oldest. (6 points)

2. What principle of stratigraphy was used to determine the order of layers J and M? (2 points)

3. What principle of stratigraphy was used to determine the order of layers C and B? (2 points)

4. Which geologist first developed the principles in questions 2 and 3? (2 points)

5. During what period was bedding O placed? (1 point)

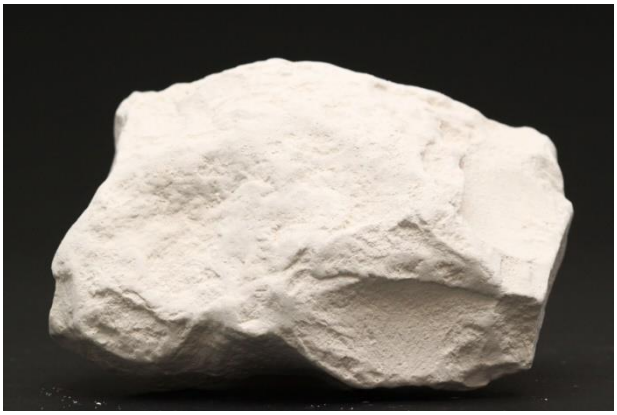
6. In which layer(s) would fossils be least likely to be found? (2 points)

7. Imagine that bedding O and J were reversed. What would be a probable explanation for its reversal? (2 points)

Station 16

A

B



C

D

1. Identify the rock types (4 points)

2. Rock C is composed of small fossilized organisms on the fossils list studied. What is its genus? (2 points)

3. Which represents a moderately high-energy environment? (1 point)

4. What type of environment does rock B show? (2 point)

5. Which rock has the least probability of preserving soft part of fossils and plants? (1 point)

6. A famous lagerstatten located in British Columbia is famous for exceptional preservation of soft parts of marine invertebrate. This lagerstatten uses which rock type (choose A-D) (1 point)

7. Which represents a common sedimentary rock type on a beach? (1 point)

Station 17

A

B

C

D

E

F

1. Which specimen reproduced by seeds? Which by spores? (2 points)

2. What is the common name of specimen B? (1 point)

3. Which of the specimen is/are extant? Which is a living fossil? (2 points)

4. What is the mode of preservation of specimen D? (1 point)

5. Which two specimen are parts of the same organism? What parts of the plant are each of them? In which period did they primarily exist? (4 points)

6. Which specimen is distributed across many continents and was used to propose the amalgamation of continents into the supercontinent Pangea? Identify the specimen. (2 points)

7. Specimen C is also known as what? During which period did it thrive? (2 points)

8. Order the following events in order from oldest to youngest (2 points)
   A) First vascular plant appear on land
   B) First angiosperms appear
   C) First abundant forests of vascular plants appear
   D) Gymnosperms become dominant
   E) Photosynthesis evolves

Station 18

A

B

C

D

1. Identify all of the specimen (4 points)

2. Specimen A represents an evolutionary transition from fish to amphibians. This type of fossil is called what? When and where were the first fossils of this specimen found? (3 points)

3. How many teeth did specimen B have? (1 point)

4. Specimen B was named after whom? (2 points)

5. What does the name of specimen D mean? What are two extant species of specimen D? (3 points) *TB4

6. What was the mode of life of specimen C? (1 point)

7. Order the specimen in order from oldest to youngest in terms of first appearance. When did each of the specimen first appear, in millions of years ago? (6 points)

Station 19

A

B

1. Identify both specimen (2 points)

2. There are three known species of specimen B. What are these species? Order then from largest to smallest in terms of size. (4 points)

3. One of the largest collections of specimen B has been obtained in what famous tar pit?(1 point)

4. Which geologist first proposed a binomial name to specimen A that made it a separate species? (2 points)

5. Name five differences between specimen A and its modern counterpart (5 points)

6. When and where were the first fossils of specimen A found? Who found them? (3 points)

7. Which bones in the throat of specimen B allowed it to roar? (2 points)

8. How were the long canine teeth used by specimen B while hunting? How many degrees was its gape? (3 points)

Station 20

Identify all of the following specimen

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O