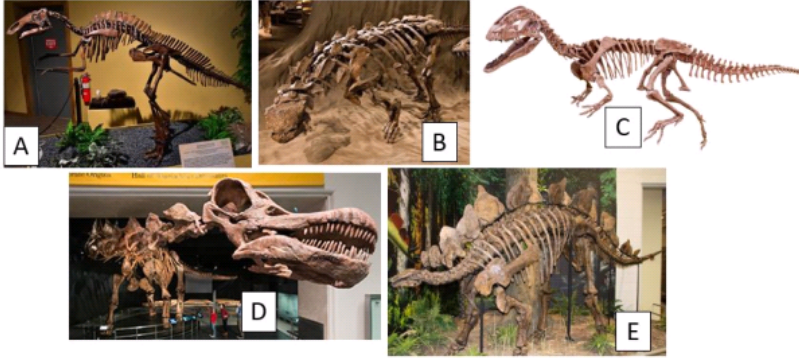


Per Texas Science Olympiad rules, you must have printed notes for this event. If you are communicating with your partner through a voice or video call, please start it before you begin the test itself.

Significant time spent outside of the browser window is grounds for a penalty or disqualification per TSO policies.

Station 1



1. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Maiasaura

2. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Ankylosaurus

3. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Dilophosaurus

4. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Patagotitan

5. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Stegosaurus

6. (1.00 pts) How many unique taxonomic infraorders are represented by the fossils shown?

- ☐ A) 1
- ☐ B) 2
- ☐ C) 3
- ☐ D) 4
- ☒ E) 5

7. (2.00 pts) Which of the fossils shown appeared most recently in the fossil record? During what geologic time period did it appear?

Expected Answer: Fossil B (Ankylosaurus); (Late) Cretaceous

8. (2.00 pts) Which if the following fossils, if any, was/were NOT herbivore(s)?

(Mark **ALL** correct answers)

- ☐ A) A
- ☐ B) B
- ☒ C) C
- ☐ D) D
- ☐ E) E

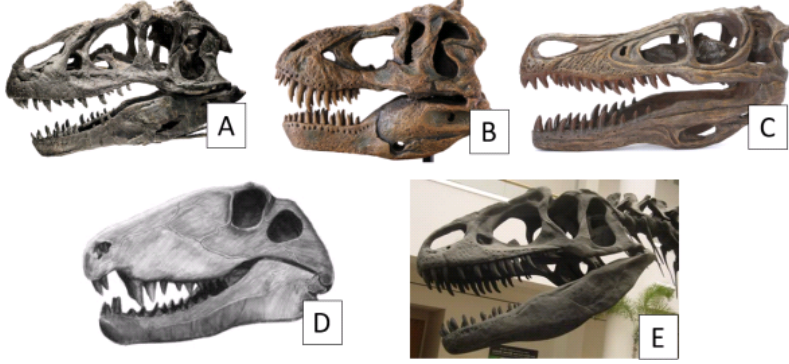
9. (1.00 pts) How did Fossil A incubate its eggs?

Expected Answer: Heat from rotting vegetation on the nest

10. (1.00 pts) T/F: Fossil B is known for having been an exceptionally social vertebrate.

- ☐ True
- ☒ False

Station 2



11. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Allosaurus

12. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Tyrannosaurus

13. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Mosasauridae

14. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Dimetrodon

15. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Tyrannosaurus

16. (1.00 pts) How many unique taxonomic genera are represented by the images?

- ☐ A) 1
- ☐ B) 2
- ☐ C) 3
- ☒ D) 4
- ☐ E) 5

17. (1.00 pts) T/F: Images A and B represent a male and a female of the same genus.

- ☐ True
- ☒ False

18. (1.00 pts) T/F: All of the fossils shown became extinct during the K-T extinction event.

- ☐ True
- ☒ False

19. (1.00 pts) Describe Fossil C's typical diet.

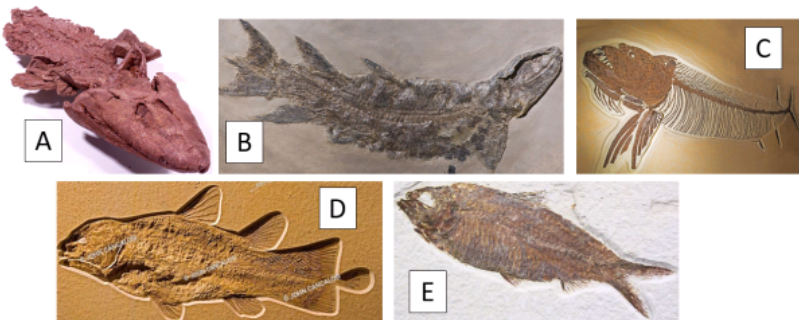
Expected Answer: Predators of fish and ammonites

20. (1.00 pts) Which of the fossils shown, if any, were quadrupedal?

(Mark **ALL** correct answers)

- ☐ A) A
- ☐ B) B
- ☐ C) C
- ☒ D) D
- ☐ E) E
- ☐ F) None of the above

Station 3



21. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Tiktaalik

22. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Eusthenopteron

23. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Xiphactinus

24. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Latimeria

25. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Knightia

26. (1.00 pts) How many unique taxonomic classes are represented by the fossils shown?

- ☐ A) 1
- ☒ B) 2
- ☐ C) 3
- ☐ D) 4
- ☐ E) 5

27. (1.00 pts) Approximately how large could members of Group C grow?

- ☐ A) 1m
- ☐ B) 2m
- ☐ C) 3m
- ☐ D) 4m
- ☒ E) 5m
- ☐ F) 6m

28. (1.00 pts) Which of the following fossils, if any, represent extant group(s)?

(Mark **ALL** correct answers)

- ☐ A) A

- ☐ B) B
- ☐ C) C
- ☒ D) D
- ☐ E) E

29. (1.00 pts) What was Fossil E's typical diet?

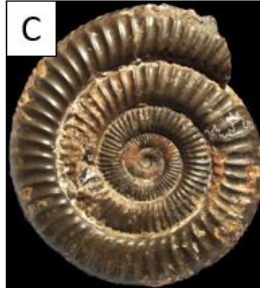
Expected Answer: Algae, diatoms, insects, small fish

30. (3.00 pts) Which of the following represent tetrapod-like characteristics of Fossil A? Select all that apply.

(Mark **ALL** correct answers)

- ☐ A) Fins
- ☐ B) Gills
- ☒ C) Ribs
- ☒ D) Lungs
- ☒ E) Mobile neck
- ☐ F) Scales

Station 4



31. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Nummulites

32. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Nautilus

33. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Dactylioceras

34. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Belemnitella

35. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Baculites

36. (1.00 pts) T/F: Fossils D and E represent males and females of the same taxonomic group.

☐ True ☒ False

37. (2.00 pts) Which of the following images, if any, represent extant group(s)?

(Mark **ALL** correct answers)

☒ A) A

☒ B) B

☐ C) C

☐ D) D

☐ E) E

38. (1.00 pts) Explain the etymology of Fossil B's scientific name.

Expected Answer: Comes from the Greek word meaning "sailor"

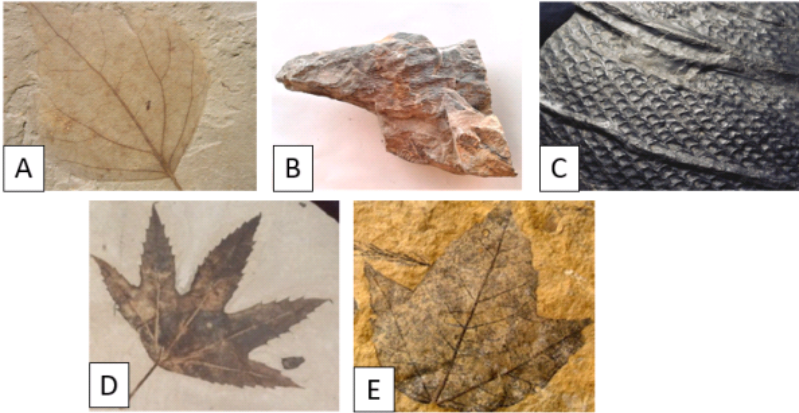
39. (1.00 pts) T/F: Complete specimens of Fossil E are rare due to its brittle nature.

☒ True ☐ False

40. (1.00 pts) What is the technical term for Fossil D's internal shell?

Expected Answer: Phragmocone

Station 5



41. (1.00 pts) Identify Fossil A to the most specific level required by the Official List.

Expected Answer: Populus

42. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Psaronius

43. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Lepidodendron

44. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Platanus

45. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Acer

46. (1.00 pts) In what habitat does/did Fossil C live?

Expected Answer: Coal forests

47. (2.00 pts) What feature of Fossil B is most commonly fossilized? What function does/did this component serve?

Expected Answer: Root mantle; Provides stability for the trunk area

48. (2.00 pts) How many times did Fossil C reproduce during its life? What is the technical term for this method of reproduction?

Expected Answer: Once; Monocarpic

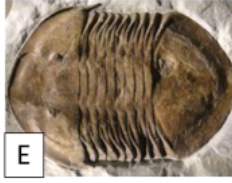
49. (1.00 pts) T/F: Fossil E was incredibly widespread due to its ability to reproduce both sexually and asexually.

☐ True ☒ False

50. (1.00 pts) Which of the fossils shown, if any, represent the only living genus in its family? Select all that apply.

(Mark **ALL** correct answers)

- ☐ A) A
- ☐ B) B
- ☐ C) C
- ☒ D) D
- ☐ E) E
- ☐ F) None of the above



51. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Calymene

52. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Eldregeops

53. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Elrathia

54. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Cryptolithus

55. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Isotelus

56. (1.00 pts) Explain the etymology of Fossil A's scientific name.

Expected Answer: "Beautiful crescent," referring to the glabella.

57. (3.00 pts) From oldest to most recent, in what order did these fossils appear in the fossil record? (Ex: G, H = J, L, I)

Expected Answer: C, A = D, E, B

58. (1.00 pts) In what US state is Fossil C commonly found?

Expected Answer: Utah

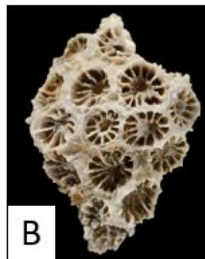
59. (1.00 pts) Which of the images depicts a taxonomic group containing the largest complete trilobite fossil ever found?

Expected Answer: E

60. (1.00 pts) How many segments did Fossil A's thorax typically contain?

Expected Answer: 13

Station 7



61. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Ceratitida

62. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Septastrea

63. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Rhynchonellida

64. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Glycymeris

65. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Goniatitida

66. (2.00 pts) How many unique taxonomic classes are represented by the images shown?

- ☐ A) 1
- ☐ B) 2
- ☐ C) 3
- ☒ D) 4
- ☐ E) 5

67. (1.00 pts) During what geologic time period did Fossil A first appear in the fossil record?

Expected Answer: Permian

68. (1.00 pts) What is the technical term for the line between Fossil C's two shells?

Expected Answer: Commisure

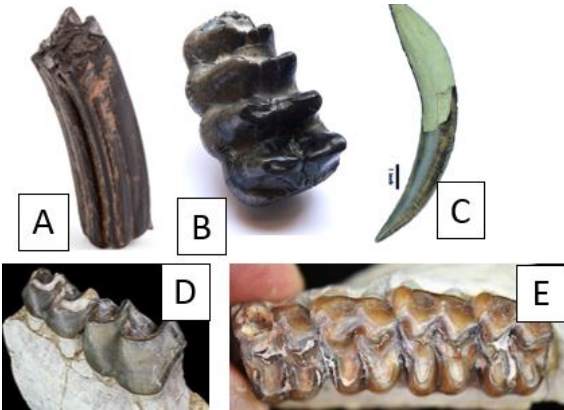
69. (1.00 pts) In what habitat was/is Fossil D typically found?

Expected Answer: Shallow seabeds

70. (1.00 pts) Was/is Fossil B found as individuals or in a colony?

- ☒ A) Individual
- ☐ B) Colonial

Station 8



71. (2.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List. What part of Fossil A's body is shown in the image?

Expected Answer: Equus; Tooth

72. (2.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Mammut

73. (2.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Smilodon

74. (2.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Megacerops

75. (2.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Meshippus

76. (1.00 pts) What does Fossil C's shape suggest about its diet?

Expected Answer: It was a predator, could hunt large animals

77. (1.00 pts) How many unique taxonomic class(es) is/are represented in the images shown?

- ☒ A) 1
- ☐ B) 2
- ☐ C) 3
- ☐ D) 4
- ☐ E) 5

78. (1.00 pts) Which of the fossils shown, if any, represent extant species?

(Mark **ALL** correct answers)

- ☒ A) A
- ☐ B) B
- ☐ C) C
- ☐ D) D
- ☐ E) E

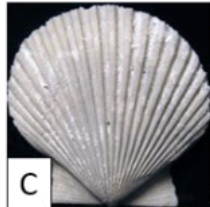
79. (1.00 pts) Describe Fossil E's typical diet.

Expected Answer: Herbivorous browser; Ate twigs & fruit

80. (1.00 pts) During what geologic epoch did Fossil D first appear in the fossil record?

Expected Answer: Eocene

Station 9



81. (1.00 pts) Identify Fossil A to the most specific taxonomic level required by the Official List.

Expected Answer: Juresania

82. (1.00 pts) Identify Fossil B to the most specific taxonomic level required by the Official List.

Expected Answer: Rafinesquina

83. (1.00 pts) Identify Fossil C to the most specific taxonomic level required by the Official List.

Expected Answer: Pecten

84. (1.00 pts) Identify Fossil D to the most specific taxonomic level required by the Official List.

Expected Answer: Astarte

85. (1.00 pts) Identify Fossil E to the most specific taxonomic level required by the Official List.

Expected Answer: Exogyra

86. (1.00 pts) How many unique taxonomic phyla is/are represented by the fossils shown?

- ☐ A) 1
- ☒ B) 2
- ☐ C) 3
- ☐ D) 4
- ☐ E) 5

87. (1.00 pts) What is the function of a lophophore?

Expected Answer: Feeding (Creates currents of water that carry food particles towards the mouth)

88. (2.00 pts) Which fossils shown belong to a phylum of which most members possess a lophophore? Select all that apply.

(Mark **ALL** correct answers)

- ☒ A) A
- ☒ B) B
- ☐ C) C
- ☐ D) D
- ☐ E) E

89. (1.00 pts) During which geologic period did Fossil D first appear in the fossil record?

Expected Answer: Ordovician

90. (1.00 pts) T/F: Both Fossils A and B were/are epifaunal species.

☒ True ☐ False

Station 10

(No images)

91. (2.00 pts) Why are fossils more likely to form if the dead organism is buried in an anoxic environment?

Expected Answer: Dead bodies are often decomposed by obligately aerobic bacteria, which cannot survive in anoxic environments.

92. (2.00 pts) What is the difference between an index fossil and a zone fossil?

Expected Answer: Index fossils: Abundant, geologically widespread, short time range; Zone fossils: All of the above, but aren't geologically widespread

93. (1.00 pts) What is the evolutionary significance of stromatolites?

Expected Answer: They are the earliest fossil evidence of life on Earth; They were produced by stromatolites, which are responsible for increasing the amount of oxygen in the Earth's early atmosphere

94. (1.00 pts) When were the earliest stromatolites formed?

Expected Answer: 3.5 billion years ago

95. (1.00 pts) Which of the following geologic periods both began and ended with a mass extinction event? Select all that apply.

(Mark **ALL** correct answers)

- ☐ A) Ordovician
- ☐ B) Silurian
- ☐ C) Cretaceous
- ☒ D) Triassic

96. (1.00 pts) Genus Lystrosaurus is famous for having survived which mass extinction event?

Expected Answer: Permian-Triassic

97. (2.00 pts) What are two characteristics that make a group a good index fossil?

Expected Answer: Distinctive; Geographically widespread; Abundant; Short lifespan

98. (1.00 pts) T/F: Dinosaurs had prehensile hands.

☒ True ☐ False

99. (1.00 pts) Pyritization and silification are sub-types of which mode of preservation?

Expected Answer: Permineralization

100. (2.00 pts) What is the difference between a cast and a mold?

Expected Answer: Cast: 3D object created when a mold is filled with sediment Mold: Impression that forms when something is pressed into a soft substrate and then removed/decomposed away

We hope you enjoyed this exam! If you have any feedback about any of the exams at this tournament, please let us know through this form: <https://tinyurl.com/utreg21feedback> (<https://tinyurl.com/utreg21feedback>)