# Fossils Practice Test SSSS 2015 KEY

PAGE 1

1. Cover page

PAGE 2

1. Anthozoa; Halysites
2. Examine polished cross section
3. Calcium carbonate
4. Septum
5. (may vary)
    a. Shallow water (or high sunlight)
    b. Clear, low turbidity water
    c. Saltwater
    d. Warm temperatures
    e. Low nutrient content

PAGE 3

1. Leptaena
2. Benthic, seafloor sediment
3. Mid-Ordovician through Devonian; throughout North America
4. Atrypa
5. Lamp shells
6. from the Greek words “arm” and “foot”

PAGE 4

1. Trilobita; Phacops
2. Glabella and eyes
3. Positioned so that it could see in all horizontal directions at once
4. enrolled
5. Elrathia kingii

PAGE 5

1. Pteridophyta, Calamites
2. Fiddleheads
3. Sporophyte
4. They must fall into water
5. Rhizomes
6. The stems are filled cavities that often filled with sediment when they broke

PAGE 6

1. Gastropoda, Turritella
2. It is still alive today
3. Agate quartz
4. Benthic, aquatic
5. whorls are more convex and have a more circular opening (aperture)

PAGE 7

1. Mollusca, Bivalvia
2. Pholadomya
3. Sea level change
4. Deep water
5. Exogyra
6. F; they lived on solid substrates

PAGE 8

1. Deinonychus
2. Fallen into water and buried by sediments
3. 3
4. Dinosaurs may have been warm-blooded due to its agile and small body; the forefeet of Deinonychus was very similar to modern birds' and prompted the theory that birds are the descendants of dinosaurs.
5. Longer/more curved claws may have helped juvenile Deinonychus to climb trees and avoid predators.

PAGE 9

1. Sphenacodontidae
2. Sexual display, thermoregulation
3. No, the genus Sphenacodon lacked sails
4. Early Permian

PAGE 10

1. Stromatolite
2. Stromatolites provide ancient records of life on Earth by fossil remains which might date from more than 3.5 billion years ago.
3. layered bio-chemical accretionary structures formed in shallow water by the trapping, binding and cementation of sedimentary grains by biofilms (microbial mats) of microorganisms, especially cyanobacteria.
4. conical, stratiform, branching, domal, and columnar types
5. Hypersaline lakes and marine lagoons
6. Shark Bay, Exuma Cays, Cuatro Ciénegas, Lake Alchichica, and many more

PAGE 11

1. Batoidea

2. Most batoids have developed heavy, rounded teeth for crushing the shells of bottom-dwelling species such as snails, clams, oysters, crustaceans, and some fish, depending on the species.

3. Just name some rays etc

4. https://en.wikipedia.org/wiki/Batoidea#Difference_between_sharks_and_rays

PAGE 12

1. An endocast or *internal mold* is formed when sediments or minerals fill the internal cavity of an organism, such as the inside of a bivalve or snail or the hollow of a skull.

2. Bioimmuration occurs when a skeletal organism overgrows or otherwise subsumes another organism, preserving the latter, or an impression of it, within the skeleton.

3. The impressions created in bioimmuration can be considered endocasts.

PAGE 13

1. Cephalon
2. Thorax
3. Pygidium
4. Left pleural lobe
5. Axial lobe
6. Right pleural lobe

PAGE 14

1. Porifera, Hydnoceras
2. 24-isopropylcholestane
3. Marinoan
4. Choanoflagellates
5. Ostia

PAGE 15

1. Bothriolepis
2. Detritovore, scavenging sediment
3. *Bothriolepis* is presumed to have spent most of its life in freshwater rivers and lakes, but was probably able to enter salt water as well because its range appeared to have corresponded with the Devonian continental coastlines.
4. True

PAGE 16

1. 75 cm (30 in), Their large size can be attributed to the moistness of the environment (mostly swampy fern forests) and the fact that the oxygen concentration in the Earth's atmosphere in the Carboniferous was much higher than today.
2. Carboniferous
3. Arthropleura
4. Many insects have been obtained from the coalfields of Saarbrucken and Commentary, and from the hollow trunks of fossil trees in Nova Scotia. Answers may vary.

PAGE 17

1. Ludfordian; 425-423 mya
2. Wenlock
3. Telychian; 438-433 mya
4. Llandovery
5. Katian
6. Sandbian
7. Darriwilian; 467-458 mya
8. Floian

PAGE 18

1. Cephalopoda, Dactylioceras
2. 172
3. Scavenging on sea floor
4. the genus Dactylioceras is extremely important in biostratigraphy, being a key index fossil for identifying their region of the Jurassic.

PAGE 19

1. Three major types of suture patterns are found in the Ammonoidea:

    **Goniatitic** - numerous undivided lobes and saddles; typically 8 lobes around the conch. This pattern is characteristic of the Paleozoic ammonoids.

    **Ceratitic** - lobes have subdivided tips, giving them a saw-toothed appearance, and rounded undivided saddles. This suture pattern is characteristic of Triassic ammonoids and appears again in the Cretaceous "pseudoceratites".

    **Ammonitic** - lobes and saddles are much subdivided (fluted); subdivisions are usually rounded instead of saw-toothed. Ammonoids of this type are the most important species from a biostratigraphical point of view. This suture type is characteristic of Jurassic and Cretaceous ammonoids, but extends back all the way to the Permian.

2. The siphuncle in most ammonoids by far is a narrow tubular structure that runs along the outer rim, known as the venter, connecting the chambers of the phragmocone to the body or living chamber. This distinguishes them from living nautiloides

PAGE 20

1. Osteichthyes
2. Bony fishes
3. Guiyu oneiros
4. Actinopterygii and Sarcopterygii
5. Unique circulatory and respiratory systems allowing metabolic heat to be transferred arterial blood via counter-current exchange; large size; elevated levels of myoglobin for faster energy transfer to muscles; see more at https://en.wikipedia.org/wiki/Tuna#Physiology

PAGE 21

1. Hyracotherium
2. Horses
3. 3; odd
4. Family Equidae
5. Palaeothere

PAGE 22

1. Turritella
2. Coquina
3. high-energy marine and lacustrine environments where currents and waves result in the vigorous winnowing, abrasion, fracturing, and sorting of the shells, which compose them
4. Turritella limestone or Turritella agate

PAGE 23

1. Parasaurolophus
2. Visual recognition of both species and sex, acoustic resonance, and thermoregulation have been proposed as functional explanations for the crest.
3. F
4. There is fossil evidence to strongly suggest that hadrosaurid dinosaurs like Parasaurolophus were prey to the top predators of the Campanian, principally the tyrannosaurs. In the north around Canada and northern portions of the USA the main genera that could have posed a serious threat to adult Parasaurolophus would have beenAlbertosaurus, Gorgosaurus and Daspletosaurus.

PAGE 24

1. Stegosaurus
2. Row of plates on back; spiked tail
3. Thagomizer
4. Morrison Formation

5. they lack the fusion of the scapula and coracoid, and the lower hind limbs

PAGE 25

1. 4, 3, 2, 5, 6, 1

PAGE 26

1. Bipedalism
2. 108cm (approximately equal to 4 times foot length)
3. Trotting ($s/l < 2.0$ for walking, $2.0 <= s/l <= 2.9$ for a trot and $s/l > 2.9$ for a run, where $s$=stride length and $l$=leg length)
4. 4 m/s
    a. Calculate the Leg Length.
    b. Calculate the Relative Stride Length. Relative Stride Length is equal to the stride length divided by the leg length.
    c. 3. The Dimensionless Speed is based on the fact that upright tetrapods (humans are bipedal tetrapods), regardless of size, move in the same way. Dimensionless speed is determined by the formula:
    $$DS = \frac{speed}{\sqrt{(leg\,length \times g)}}$$
    g = acceleration due to gravity (10 m/s2)
    d. In order to calculate the Dimensionless Speed use the following equations, where RSL is Relative Stride Length, and DS is Dimensionless Speed:
    RSL = 1.1 x DS + 1
    DS = (RSL - 1)/1.1
    e. The actual speed in meters per second is calculated using the following formula:
    $$Speed = (\sqrt{leg\,length \times g}) \times DS$$

5. Herd or migratory behavior

PAGE 27

1. Tentacles
2. Gullet
3. Polyp
4. Corallum
5. Septum
6. Enteron
7. Mesenteries
8. Tabulae
9. Dissepiments
10. Outer wall (epitheca)
11. Septa
12. Calice (cup for polyp)

13. Corallum

PAGE 28

1. Pinophyta Metasequoia
2. Pteridospermatophyta Glossopteris
3. Anthophyta Acer
4. 475 mya
5. the following:
    a. Development of spores with durable protective walls allowing the spores to tolerate dry conditions;
    b. Waxy cuticle to reduce water loss across cell walls;
    c. Development of a vascular system allowing plants access to water deep in the soil;
    d. Stomata, which are pores in the cuticles of leaves which can open and close;
    e. Specialized cells with thickened cell walls for rigid support
6. Specimen B represents conifers/gymnosperms, specimen C represents flowering plants/angiosperms

PAGE 29

1. a sedimentary deposit that exhibits extraordinary fossils with exceptional preservation
2. Cambrian Maotianshan shales and Burgess Shale, the Devonian Hunsrück Slates and Gogo Formation, the Carboniferous Mazon Creek, the Jurassic Solnhofen limestone, and the Cretaceous Santana and Yixian formations. See also: https://en.wikipedia.org/wiki/Lagerst%C3%A4tte#Important_Konservat-Lagerst.C3.A4tten
3. (incomplete list)
    a. Orsten-type and Doushantuo-type preservations preserve organisms in phosphate.
    b. Bitter Springs-type preservation preserves them in silica.
    c. Carbonaceous films are the result of Burgess Shale-type preservation
    d. Pyrite preserves exquisite detail in Beecher's trilobite-type preservation.
    e. Ediacaran-type preservation preserves casts and moulds with the aid of microbial mats.
4. Solnhofen limestone

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1. I, B, M, F, R
2. Approximately 12088 years ago