SSSS 2019 FOSSILS KEY

There are 12 stations, each worth 20 points.
Tiebreaker Stations (in order): 02, 09, 01, 06

Station 01
01. A - Annularia (1); carbonization/coalification (1); organic carbon is compressed (1) into a carbonaceous film (1)
B - Dactylioceras (1); cast (1); the cavity of an organism (1) is filled with another substance (1)
02. Calamites (1); Form Taxa (1)
03. Spore-Bearing (1)
04. Carboniferous (1) & Permian (1)
05. Cephalopoda (1); Ammonoidea (1)
06. Goniatic, Ceratitic, & Ammonitic (1 each); Ammonitic (1)
07. Spawning (1)

Station 02
01. DCEGBIJMNLFHKAQ or DCGEBIJMNLFHKAQ (6, -1 for each one out of order or each pair switched, minimum 0)
02. Disconformity (1) between C and I (1), Nonconformity (1) between B and I (1), Angular Unconformity (1) just before F (1), Angular Unconformity (1) between A and Q (1)
03. Faults are younger than the rock they cut across. (2)
04. 1.25 billion years (1)
05. 7.42 million years (3)

Station 03
01. D - Eryops (1);
E - Lystrosaurus (1)
02. Terrestrial (1)
03. Fish (1) and aquatic tetrapods (1)
04. Inertial Method (2); Crocodiles (2)
05. 1 (±0.1) m (1)
06. They used horny beaks to shear off vegetation (1) and then ground the vegetation on a horny secondary palate (2) with a shearing forward and back movement (2)
07. Amniotic Egg (2)
08. Sauropsids have faveolar/through-flow lungs while synapsids have alveolar/tidal flow lungs, sauropsids produce uric acid while synapsids produce urea, synapsids have one temporal fenestra, synapsids have differentiated teeth while sauropsids don't, synapsids have a secondary palate, etc. (1 each, maximum 3)

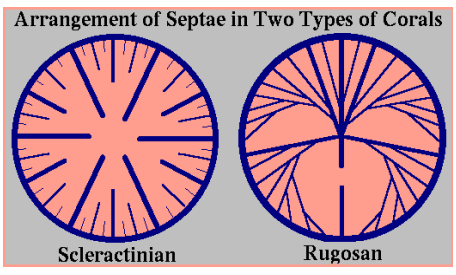
Station 04
01. F - Fusulinida (1); Protista/Protozoa (1)
G - Graptolithina (1); Animalia (1)
02. G (1) **03.** Test (1)
04. Reticulopodia/Reticulose Pseudopodia (2, 1 for only pseudopodia)
05. Shallow (1), Marine (1)
06. Carbonization/Coalification (1)
07. Planktonic (2)
08. Sicular Zooid (1, 0.5 for sicula); rhabdosome (1)
09. Efficient feeding (1) and prevents sinking (1)
10. Outpocket of the gut (1.5) originally thought to be related to chordate notochord (1.5)

Station 05
01. H - siltstone (1); clastic (1)
I - coquina (1); biochemical (1)
J - shale (1); clastic (1)
02. IHJ (2) **03.** I (1)
04. Liquids trapped in the pores of sedimentary rocks
05. Coquina (1); Effervescence (2)
06. Fissility (1) **07.** 5.8 (3)
08. A sediment bed is finer at the top/coarser at the bottom (2)

Station 06
01. Concentration lagerstätten exhibit a large quantity of fossils (1.5) while conservation lagerstätten exhibit exquisite preservation (1.5)
02. Anoxia (1), Rapid Sedimentation (1)
03. K - Mazon Creek (1); Carboniferous (1)

L - Green River Formation (1); Paleogene (1)
M - Yixian Formation (1); Cretaceous (1)
04. Tropical (1) delta (1)
05. Authigenic Mineralization (2)
06. Colorado/Utah/Wyoming Border (1)
07. 2.26 (±0.04) m (2)
08. Limnic Eruption (2)

Station 07
01. N - Hexagonaria (1); calcite (1)
O - Rhombopora (1); calcite (1)
P - Septastrea (1); aragonite (1)
02. Shelly fossils will dissolve (1) when they settle below the carbonate compensation depth (1) because the rate of carbonate dissolution will exceed the rate of carbonate formation
03. Paleogene (1); Ongoing/Hasn't Ended (1)
04. Ancestrula (2)
05. Septae are the internal divisions of the coralline (1), thecae are the divisions that separate the corallites (1), tabulae are horizontal partitions (1)
06.



(1 for scleractinian corals having radial septae, 1 for scleractinian corals having septae in multiples of 6, 1 for rugose corals having serial septae, 1 for rugose corals having septae in groups of 4)

Station 08
01. Q - Allosaurus (1); theropod (1)
R - Diplodocus (1); sauropod (1)
S - Velociraptor (1); theropod (1)
02. Saurischia (1); saurischians have their pubis bone pointing forward while ornithischians (1 for mentioning order) have theirs pointing backward
03. Saurischia (1)
04. Polyphyodont (2)
05. QR (1 each, -1 if S is selected, minimum of 0)
06. No (1); R was too big (1)
07. No (1); they lived at different times (1)
08. S (2, -1 for each Q/R selected, minimum of 0)

Station 09
01. T - Banded Iron(stone) Formation (1); cyanobacteria produced oxygen (1) which combined with iron in the early oceans (1), precipitated as iron oxides (1) and were deposited on the sea bed in annual varves (1)
U - Stromatolite (1); a layer of cyanobacteria mucilage (1) precipitate minerals from the water (1) and trap sediments (1) forming layers and growing upward, the cyanobacteria occupy the topmost layer (1)
02. Hematite (Fe_2O_3) (1) and Magnetite (Fe_3O_4) (1)
03. There were no grazers (3)
04. Leg Length = 0.8 m (1)
Relative Stride Length = 0.25 (1)
Dimensionless Speed = 0.227 (±0.01) (1)
Speed = 0.065 (±0.002) m/s (2)

Station 10
01. V - Ichthyosauria (1)
W - Basilosaurus (1)
02. VW (1 each)
03. Chordata (1); notochord (1), dorsal nerve cord (1), pharyngeal slits (1), endostyle (1), and post-anal tail (1)
04. Late Triassic (1, 0.5 for only Triassic)
05. Hourglass (1)
06. Scleral/Sclerotic Ring (1); to support the eyes (1), especially in marine animals (1); No (1)
07. A mass of adipose tissue (1) that helps in sound focusing (0.5) and transmission (0.5); No (1)
08. 25000 kPa (1, 0.5 for 3600 lb/in^2)

Station 11

01. X - Isotelus (1); Opisthoparian (1)
Y - Eurypterida (1); does not apply (1)
Z - Elrathia (1); Opisthoparian (1)
02. X (2, -1 for each Y or Z selected, minimum 0)
03. Mouthpart of a trilobite (1); Conterminent (1); it is forked (2)
04. Prosoma (1), Opisthosoma (1) (1 point for them being in that order)
05. Arachnids/Arachnida (1)
06. Upper joints of appendages (1) used for mastication/chewing (1)
07. 13 (2)

Station 12

01. AA - Atrypa (1)
BB - Pecten (1)
CC - Leptaena (1)
02. B (1) because it had eyes (1) and could move (1)
03. None OR AA (-1 for each of BB or CC selected, minimum 0)
04. None (2, -1 for each specimen selected, minimum 0)
05. No (1)
06. In AA, adductors close the shell (1) and diductors open it (1); in BB, adductors close the shell (1) and no muscles close it as the shell is naturally open (1)
07. Ctenolium (1)
08. Rugae (1); to strengthen and stabilize the shell (1)