

2025 USESO Training Camp – Practical Exam

Total: **XXX**/156

Name: **KEY**

Station 1 _____/8

- 1) Diorite
- 2) Scoria
- 3) Basalt
- 4) 1. 2. **3.** None of the Above
- 5) 1. 2. 3. **None of the Above**
- 6) **A.** B. C. D.
- 7) **A.** B. C. D.
- 8) **Mafic** Intermediate Felsic

Station 2 _____/7

- 9) Quartz (rose)
- 10) A. **B.** C. D. E. F. G
- 11) **A.** B. C. D.
- 12) A. **B.** C. D.
- 13) Striations (on crystal face)
- 14) Quartz
- 15) A. B. **C.** D. E.

Station 3 _____/7

- 16) Corundum
- 17) **A.** B. C. D. E.
- 18) A. B. C. **D.** E.
- 19) A. B. C. D. **E.**
- 20) A. B. **C.**
- 21) Yes **No**
- 22) The other inclusions are different minerals and are unrelated to the orientation of the surrounding crystal.

Station 4 _____/8

- 23) Fluorite
- 24) Flux, hydrofluoric acid (HF)
- 25) Bauxite
- 26) Aluminum ore
- 27) Hematite
- 28) Iron ore, red pigment
- 29) Sphalerite
- 30) Zinc ore

Station 5 _____/7

- 31) A. **B.** C. D.
- 32) **A.** B. C. D.
- 33) A. B. C. **D.**
- 34) **A.** B. C. **D.**
- 35) **A.** B. **C.** D.
- 36) A. C. **D.**
- 37) A. B. **C.** D.

Station 6 _____/8

- 38) Conglomerate
- 39) Breccia
- 40)

Delta	Alluvial Fan	River	Beach	Landslide
1 pt each	40	38		39
- 41)
- 42)
- 43) Beds/bedding planes/individual sediment deposits
- 44) The sediment changes from large and angular to relatively small (or vice versa) in a repeating sequence.
- 45) Rain storms/seasonal melt off/rock slides/or similar causes periods of larger sediment to be deposited, followed by smaller sediments.

Station 7 _____/7

- 46) Shale
- 47) Sandstone
- 48) **46A** 46B 47A 47B
- 49) They are impermeable (oil cannot flow through).
- 50) Limestone can dissolve making it permeable OR limestone is brittle, leading to fractures making it permeable (or vice versa).
- 51) No (½). It was stained by oil and organics migrating upwards from oil shale or similar source rock (½).
- 52) A. **B.** C.



Station 8

____/8

- 53) A. B. **C.** D. E.
54) A. B. **C.**
55) Galena
56) **A.** B. C.
57) Satin-Spar
58) A. B. **C.**
59) Magnetite
60) A. **B.** C.

Station 9

____/8

- 61) Marble
62) Limestone (1/2), contact (1/2)
63) Gneiss
64) Regional/Barrovian
65) Migmatite
66) Slate
67) 61. **63.** 66.
68) No (1/2), no liquid water/active tectonics (**NOT SCORED;**
Mars does not currently have water, but it did in its geologic
past. Serpentinite can be found on Mars.)

Station 10

____/8

- 69) Obsidian
70) Ultramafic Mafic Intermediate **Felsic**
71) Conchoidal
72) Cristobalite
73) Higher pressure favors lower volume phases. Solids are lower volume phases so a higher temperature must be reached to undergo phase transition.
74) **A.** Kyanite **B.** Sillimanite
75) Graphite
76) Metastable

Station 11

____/8

- 77) Apatite
78) Dolomite
79) Beryl
80) Biotite
81) Topaz
82) Aragonite
83) Talc
84) Epidote

Station 12

____/8

- 85) Komatiite
86) Peridotite
87) Spinifex
88) 85 cooled much more rapidly than 86.
89) Olivine
90) Basalt
91) Sills
92) Joints (1/2), cooling direction was to the top and bottom of the sill. (1/2)

Station 13

____/8

- 93) Halite
94) Calcite
95) Celestite
96) Ulexite
97) Barite
98) Death Valley, ulexite requires borate, which is only concentrated enough (i.e., brine) in enclosed arid basins to crystallize.
99) A. B. **C.** D. E.
100) **A.** B. C. D. E.

Station 14

____/8

- 101) Cross bedding.
102) **Yes** No
103) The concavity on the cross bedding points down; it should point up unless overturned.
104) Yes **No**
105) Mudcracks widen upwards when not overturned as seen.
106) Yes (1/2). There are inclusions of G in A. Law of Inclusions (1/2)
107) Regressing/lowering/going down
108) Shale is deep water, sandstone shallow, therefore, water levels must have gone down.

Station 15

____/8

- 109) **A.** B. C. D. E.
110) Shale
111) A. B. C. **D.** E.
112) North-South or Northwest-Southeast
113) A. **B.** C. D. E.
114) Dolomite
115) A. B. **C.** D. E.
116) 7

Station 16

____/8

- 117) A. B. **C.** D. E.
118) Thicker (½), has more frequent deposition of sediment OR the floodplain is lower, so sediment moves downhill. (½)
119) A. B. C. D. **E.**
120) C is dark in color, with reddish regions from the higher iron content. Also, cracks may indicate higher clay content.
121) **A.** B. C. D. E.
122) The soil is thin, bedrock is very shallow. Glacier removed soil, and it has not had much time to reform, especially in colder climates.
123) A. B. C. **D.** E.
124) **A.** B. C. D. E.

Station 17

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- 125) Granite
126) Marble
127) Kaolinite
128) Acidic (½), weathering of felsic minerals releases silicic acid. (½)
129) Yes (½), forms from the weathering of feldspars such as those in granite. (½)
130) Well drained (½), marble does not produce a lot of clay minerals **OR** easily dissolves voids that allow drainage. (½)
131) C (regolith)
132) 125 126 **Neither**

Station 18

____/8

- 133) Beach
134) Deep Marine
135) River Channel
136) Deep Marine
137) Chalk
138) Oolitic Limestone
139) A. B. C. **D.** E.
140) Layers of calcite precipitate around small nuclei (½) as they roll around shallow marine environments. (½)

Station 19

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- 141) Selenite
142) Kyanite
143) Amphibolite
144) Amphibolite
145) No (½), the facies is just the metamorphic grade, whereas gneiss is a textural classification (although it typically refers to something more felsic). (½)
146) 510-550 °C (½) 17-20 **km** (½)
147) Dehydration (½), Anhydrite (½)

Station 20

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- 148) Pumice
149) Coal
150) Gabbro
151) Rhyolite
152) Coquina
153) Andesite
154) Tuff
155) Slate
156) Phyllite