2024 USESO Training Camp – Practical Exam

Total: 123/123

Name: KEY

Station 1 ___/7

1) Scoria
2) *[Property of 1]*
3) Peridotite
4) Olivine and quartz
5) Forsterite (Olivine)
6) Increasing Ca/anorthite content
7) Higher temperature

Station 2 ___/6

8) Sandstone
9) B
10) B
11) A
12) Lacustrine
13) Glacial

Station 3 ___/8

14) Magnetite
15) *[Property of 14]*
16) Hematite
17) Galena
18) Specimen 17
19) The minerals at the station are more stable (½). Basalt is composed of relatively unstable silicates while hematite/magnetite cannot weather much (½).
20) Lens for cleavage planes/opacity; also streak/hardness/magnetism (less useful but correct)
21) Downstream (½). The basaltic sample is less dense and would not deposit until water velocity drops downstream (½).

Station 4 ___/6

22) Schist
23) *[Property of 22]*
24) Gneiss
25) B
26) E
27) The texture/origins/formation are similar, but mineralogically they are different due to different starting compositions.

Station 5 ___/6

28) Komatiite
29) *[Property of 28]*
30) Granite
31) Aashray (½). Olivine is susceptible to alteration and komatiite is old (½).
32) Serpentinite/chlorite (½ for olivine)
33) Migmatite

Station 6 ___/8

34) Obsidian
35) Amphibolite
36) Shale
37) Flow
38) Shear/normal pressure
39) Bedding/deposition/settling
40) Jointing (½). Brittle fractures from stresses imposed on the rock after formation (½).
41) Grading (½). Settling of particles (½).

Station 7 ___/8

42) Beryl
43) Chlorite
44) Ulexite
45) Hornblende
46) Graphite
47) Barite
48) Sphalerite
49) Dolomite

Station 8 ___/6

50) Corundum
51) Gemstones/abrasives/optics
52) Malachite
53) Copper ore/gemstone
54) Orthoclase/microcline
55) Ceramics or similar uses

Station 9 ___/7

56) Fluorite
57) [Property of 56]
58) Albite
59) Core (½). Crystals grow outwards (½).
60) Unexpected (½). Plagioclase forms at higher temps therefore should crystallize first (½).
61) Mg/Fe depleted OR silica concentration went up OR olivine reacted with silica around it
62) It was in flux (chemistry was changing)

Station 10 ___/6

63) Andesite (porphyritic)
64) Quartzite
65) A
66) D
67) A
68) Trigonal/hexagonal

Station 11 ___/6

69) Breccia
70) [Property of 69]
71) Conglomerate
72) [Property of 71]
73) A
74) D

Station 12 ___/6

75) Coal
76) [Property of 75]
77) Limestone (fossil)
78) No (½). Fine-grained carbonates with no reef fossils are likely to be deep water while coal is typically from swamps adjacent to shallow water. There should be sandstone or another intermediary above the coal (½).
79) 1
80) Carbonates

Station 13 ___/5

81) Quartz
82) [Property of 81]
83) Diorite
84) High (½). It likely formed early in order to have space to crystallize (½).
85) Yes (½). Minerals high in Bowen's reaction series and the crystalloblastic series both have higher free energy (½).

Station 14 ___/6

86) Calcite
87) [Property of 86]
88) Apatite
89) Metamorphic
90) Apatite is not common in sedimentary rocks and calcite is not common in igneous rocks (as the dominant mineral)
91) Pegmatite

Station 15 ___/6

92) Talc
93) [Property of 92]
94) Staurolite
95) [Property of 94]
96) C
97) A

Station 16 ___/6

98) Basalt
99) [Property of 98]
100) Pumice
101) No (½). Obsidian needs more felsic magma to form (½). (Some volcanic glass may form, but not obsidian.)
102) No (½). Pumice is also usually on the intermediate to felsic side and is rarely basaltic (½).
103) Gabbro

Station 17 ___/6

104) Rhyolite
105) Sodalite
106) Muscovite
107) Phonolite
108) Syenite
109) Silica

Station 18 ___/5

110) C
111) The soil is an ultisol which requires precipitation to leach the soil. The southeast has the most rain.
112) A (½). Leached soil lack cations/are more acidic (½).
113) D
114) C

Station 19 ___/4

115) A (½). Clay has high cohesion and can make a longer, smoother ribbon (½).
116) B (½). Clay is unlikely to deposit in the river (½).
117) A (½). Clay will trap leachate/contaminants since it drains poorly (½).
118) Neither (½). A volume filled with spheres has the same amount of open space regardless of sphere size (½).

Station 20 ___/5

119) Travertine
120) Slate
121) Augite
122) Satin-spar (gypsum)
123) Topaz