

MIZORAM PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF GEOLOGIST JUNIOR UNDER COMMERCE & INDUSTRIES DEPARTMENT, GOVERNMENT OF MIZORAM, JANUARY, 2020

GEOLOGY PAPER - II

Time Allowed : 2 hours

Full Marks : 200

All questions carry equal marks of 2 each.

Attempt all questions.

1. A simple instrument used for the measurement of interfacial angles is known as
 - (a) protractor
 - (b) goniometer
 - (c) inclinometer
 - (d) sextant
2. The highest number of axes of symmetry is
 - (a) 6
 - (b) 9
 - (c) 11
 - (d) 13
3. A 6 fold rotoinversion axis involves rotating the object by
 - (a) 60 degree
 - (b) 90 degree
 - (c) 120 degree
 - (d) 180 degree
4. The Monoclinic System has only mirror plane(s) or a single
 - (a) 1-fold axis
 - (b) 2-fold axis
 - (c) 3-fold axis
 - (d) 4-fold axis
5. _____ are defined as the relative lengths of the crystallographic axes
 - (a) Miller Indices
 - (b) Axial ratios
 - (c) Parameter
 - (d) Crystal form
6. The mineral of tetragonal crystal, the face labeled (0hl) would have the Miller Index is
 - (a) (001)
 - (b) (011)
 - (c) (012)
 - (d) (013)
7. Metals thus tend to form positively charged ions called
 - (a) cations
 - (b) anions
 - (c) metallion
 - (d) valence
8. The amount of energy required to remove an electron is called the
 - (a) electronegativity
 - (b) van der walls
 - (c) ionization potential
 - (d) ionic bonds
9. Internal arrangement of atoms in a crystal structure made up of 3-dimensional arrays are called
 - (a) crystal symmetry
 - (b) translational symmetry
 - (c) lattices
 - (d) space lattices
10. A face is more commonly developed in a crystal if it intersects a larger number of lattice points is known as
 - (a) Law of Constancy
 - (b) Bravais Law
 - (c) Bragg's Laww
 - (d) Miller's Law

11. Augite is optically positive with a $2V$ of about
 - (a) 30 degree
 - (b) 60 degree
 - (c) 90 degree
 - (d) 120 degree
12. Sodium aluminum pyroxene that is characterized by its presence in metamorphic rocks formed at relatively high pressure is
 - (a) Nepheline syenites
 - (b) Grunerite
 - (c) Augite
 - (d) Jadeite
13. Exsolution of sodic plagioclase in a K-feldspar during the cooling process is termed
 - (a) perthite
 - (b) antiperthite
 - (c) trachytic
 - (d) hyalophytic
14. A centered uniaxial interference figure consists of dark bands that cross the field of view to form a black cross called
 - (a) isogyres
 - (b) isochrome
 - (c) melatope
 - (d) interference
15. A solid compound that meets the other criteria, but has not definite crystal structure is said to be
 - (a) volcanic
 - (b) pegmatite
 - (c) semi crystal
 - (d) amorphous
16. The charge on the ion becomes more negative, there will be more electrons and the ion will have a
 - (a) smaller radius
 - (b) larger radius
 - (c) smaller ion
 - (d) larger ion
17. The anion will be more strongly bound to the central coordinating cation than it can be bonded to other structural groups is said
 - (a) anisodesmic
 - (b) mesodesmic
 - (c) isodesmic
 - (d) parsimony
18. Rocks composed almost entirely of talc have a greasy feel and are referred to as
 - (a) sliperytone
 - (b) powderstone
 - (c) soapstone
 - (d) greasystone
19. With the help of Pb-Pb isochron, best estimate of the age of the Earth is
 - (a) 6 billion years
 - (b) 4.55 billion years
 - (c) 3.96 billion years
 - (d) 2.5 billion years
20. Rare Earth Elements (REE) that do fit easily into the crystal structure of minerals in the mantle is called
 - (a) compatible elements
 - (b) incompatible elements
 - (c) crystalline elements
 - (d) semi crystal
21. Weight percentage of Silica content in Rhyolitic Magma is
 - (a) 45 - 55
 - (b) 55 - 65
 - (c) 65 - 75
 - (d) 75 - 85
22. Temperature of Basaltic Magma is
 - (a) 450 - 650 °C
 - (b) 650 - 800 °C
 - (c) 800 - 1000 °C
 - (d) 1000 - 1200 °C

23. _____ are relatively small plutons that usually show a concave downward upper surface.
- (a) Lopoliths (b) Batholiths
(c) Stocks (d) Laccoliths
24. Volcanic eruption that consist mostly of gas bubbles result in a low density highly vesicular rock fragment called
- (a) pumice (b) vesicles
(c) lapilli (d) bombs
25. If the size of the grains are so small that crystals cannot be distinguished with a handlens, the igneous rock texture is said
- (a) porphyritic (b) phaneritic
(c) aphanitic (d) holohyaline
26. Most of the igneous grains are subhedral - that is they bounded by only a few well-formed crystal faces, the fabric is said to be hypidiomorphic granular.
- (a) idomorphic granular (b) hypidiomorphic granular
(c) allotriomorphic granular (d) Glomeroporphyritic
27. Microscopic examination of igneous rocks shows smaller grains of one mineral are completely enclosed in large, optically continuous grains of another mineral is called
- (a) Poikilitic texture (b) Ophitic texture
(c) Myrmekitic texture (d) Intergranular texture
28. If we calculate a CIPW Norm the normative minerals that occur in silica undersaturated rocks is
- (a) nepheline (b) kyanite
(c) andalusite (d) sillimanite
29. Minerals melting wherein a phase melts to a liquid with the same composition as the solid is called
- (a) Intermediate compound (b) Exsolution
(c) Incongruent melting (d) Congruent melting
30. In binary eutectic diagram a line separating the field of all solid from that of liquid plus crystals is called
- (a) Liquidus (b) Solidus
(c) Water interfaces (d) Soil interface
31. The average density of the Earth is about
- (a) 2200 kg/m³ (b) 3200 kg/m³
(c) 4200 kg/m³ (d) 5200 kg/m³
32. Mantle is made up of a rock called
- (a) xenolith (b) peridotite
(c) rhyolite (d) amphibole
33. Most of the heat within the Earth is generated by
- (a) radioactive decay (b) mantle convection
(c) magma melting (d) frictional heat
34. When the continental crustal rocks partial melting is called
- (a) crustal anatexis (b) crustal migmatite
(c) crustal xenolith (d) hot spot
35. Any process that causes magma composition to change is called
- (a) malignite (b) magmatism
(c) magmatic differentiation (d) magmatic evolution

36. The peridotite family contains Diamond is called
(a) Dunite (b) Kimberlite
(c) Wehrlite (d) Harzburgite
37. Most of the Rare Earth Elements (REE) ionic radius is
(a) small (b) medium
(c) large (d) infinite
38. Tholeiitic basalts constituting the oceanic crust are termed
(a) MORBs (b) OIBs
(c) LIPs (d) CFBs
39. Bowen's Reaction Series composed of the plagioclase feldspar solid solution series is
(a) discontinuous reaction series (b) continuous reaction series
(c) crystal reaction series (d) crystal fractional series
40. Calcite-carbonatite with a medium to fine grained is called
(a) beforosite (b) sovite
(c) alvikite (d) ijolite
41. Metamorphism occurs at temperatures and pressures higher than 200°C and
(a) 250 MPa (b) 300 MPa
(c) 350 MPa (d) 400 MPa
42. High-grade metamorphism takes place at temperatures greater than
(a) 265°C (b) 290°C
(c) 320°C (d) 340°C
43. Contact metamorphism is often referred to as _____ metamorphism.
(a) high temperature - low pressure (b) high temperature - high pressure
(c) low temperature - low pressure (d) low temperature - high pressure
44. Foliated rock such as slates, schists, and gneisses occurs as a result of
(a) contact metamorphism (b) cataclastic metamorphism
(c) hydrothermal metamorphism (d) regional metamorphism
45. A metamorphic rock that shows no foliation with large grain size is called
(a) hornfels (b) granulite
(c) phyllite (d) schist
46. In metamorphic rocks individual minerals bounded by their own crystal faces are termed
(a) idioblastic (b) xenoblastic
(c) crystalloblast (d) poikiloblastic
47. In triangular composition diagram mineral phases that coexist with each other at this temperature and pressure are connected by lines is called
(a) cross lines (b) assemblage line
(c) tie lines (d) knot lines
48. The ACF diagram is used for representing the phase relation in Mafic rocks and
(a) Calc-silicates (b) Calcareous rocks
(c) Basic rocks (d) Pelitic rocks
49. The phase rule is:
(a) $F = C - 2 - P$ (b) $F = C + 2 - P$
(c) $F = C + 2 + P$ (d) $F = C - 2 + P$

50. The AFM diagram is used for representing the phase relation in
(a) Ultramafic rocks (b) Calc-silicates
(c) Pelitic rocks (d) Calcareous rocks
51. In prograde metamorphism, low grade rocks andalusite phase disappeared and high grade rocks appeared is
(a) hornblende (b) plagioclase
(c) biotite (d) sillimanite
52. In progressive metamorphism phase change from calcite to wollastonite reaction is
(a) dehydration reaction (b) decarbonation reaction
(c) hydration reaction (d) carbonation reaction
53. In Retrograde metamorphism Garnet Muscovite Schist change into
(a) Garnet Chlorite Schist (b) Garnet Wollastonite Schist
(c) Anorthite Muscovite Schist (d) Albite Muscovite Schist
54. The solid-solid reaction reactants Andalusite product Kyanite, dP/dT is
(a) positive (b) negative
(c) neutral (d) None of the above
55. _____ is the most common indicator of ultrahigh-pressure metamorphism.
(a) Sylvanite (b) Xenolith
(c) Coesite (d) Apatite
56. The shallowest levels of ocean crust are only weakly metamorphosed to
(a) zeolite facies (b) blueschist facies
(c) eclogite facies (d) greenschist facies
57. A plane of constant metamorphic grade in the field, it separates metamorphic zones of different metamorphic index minerals is
(a) Isozone (b) Isograd
(c) Isofield (d) Isoplane
58. Metamorphic mineral assemblages with medium to coarse grained, dark colored rocks whose principal minerals are hornblende and plagioclase is called
(a) Marbles (b) Quartzites
(c) Ecogites (d) Amphibolites
59. In Paired metamorphic belts, metamorphism on the oceanic side belts of high pressure, low temperature were associated with metamorphism on the continent side belts of
(a) low pressure, low temperature (b) high pressure, high temperature
(c) high pressure, low temperature (d) low pressure, high temperature
60. The Superior province (Archean craton) consists of four types of metamorphic terrains they are granulite terrains, greenstone belts, gneiss terrains and
(a) metasedimentary belts (b) blueschist belts
(c) Ecogite terrains (d) zeolite terrains
61. Strained quartz is attributed to deformation of the crystal lattice, which gives the grain irregular optical properties and its presence can be used as an indicator of
(a) clay minerals (b) provenance
(c) sedimentary basin (d) rock age

62. Sediment diagenesis processes occur at relatively low temperatures, typically below about
(a) 150 °C (b) 200 °C
(c) 250 °C (d) 300 °C
63. A seam of sedimentary material that fills an open fracture in and cuts across sedimentary rock strata or layering in other rock types is called
(a) clastic dike (b) elutriation pipe
(c) diapir (d) pillar
64. Bands of colour formed by concentrations of iron oxides in irregular layers within a rock are called
(a) liesegangen bands (b) septarian bands
(c) varve (d) rhythmic bands
65. The Udden–Wentworth grain-size scale for sand sediments is
(a) 0.125 to 3 mm (b) 0.625 to 3 mm
(c) 0.0625 to 2 mm (d) 0.0135 to 2 mm
66. Conglomerate that contains just two or three type clast present is called
(a) monomict (b) oligomict
(c) polymict (d) terimict
67. Heavy minerals have densities greater than _____ g /cubic cm.
(a) 3.25 (b) 3.00
(c) 2.85 (d) 2.65
68. In sandstone classification the amount of matrix present is between 15 – 75% is called
(a) wacke (b) arenite
(c) mudstone (d) lithic
69. Sedimentary structures that provide information about the flow differentiate between upstream and downstream directions is called
(a) Unidirectional indicators (b) Polydirectional indicators
(c) Flow axis indicators (d) Flow pole indicators
70. A study that focuses on the trace fossils in the rock would be a description of the
(a) tracefacies (b) biofacies
(c) ichnofacies (d) fossil facies
71. Supratidal mudflat or sandflat in which evaporite-saline minerals accumulate as the result of semiarid to arid climate are called
(a) Peat bogs (b) Fen
(c) Swamps (d) Sabkhas
72. The process in which hydrocarbons move along a porous and permeable layer to its final accumulation is called
(a) primary migration (b) secondary migration
(c) oil phase migration (d) migration in solution
73. Which sediment deposits is poorly sorted among glacial, river, beach and aeolian.
(a) glacial (b) river
(c) beach (d) aeolian
74. Movement of the shoreline seawards as a result of sedimentation occurring at the coast is called
(a) transgression (b) regression
(c) aggradation (d) None of these

75. Deposits on the shelf formed during a period of relative sea level rising faster than the rate of sediment supply are referred to as
- (a) falling stage systems tract (FSST)
 - (b) lowstand systems tract (LST)
 - (c) transgressive systems tract (TST)
 - (d) maximum flooding surface (MFS)
76. The accretionary ridge and Island arc form a basin that accumulates sediment from the island arc is called
- (a) Forearc basin
 - (b) Transtensional basin
 - (c) Rift basin
 - (d) Passive margin basin
77. In QFL triangle, Craton sands are clustered near the
- (a) Q pole
 - (b) F pole
 - (c) L pole
 - (d) centre
78. What pattern is one of the distinctive characteristics of a shallowing-up deltaic succession?
- (a) mixed load
 - (b) fining up
 - (c) coarsening-up
 - (d) muddy
79. If the limestone is clast-supported it is termed
- (a) grainstone
 - (b) packstone
 - (c) boundstone
 - (d) framestone
80. The sedimentary basins of India, onland and offshore up to the _____ isobath.
- (a) 100m
 - (b) 150m
 - (c) 200m
 - (d) 250m
81. The number one environmental problem is excessive human
- (a) waste
 - (b) population growth
 - (c) hazard induces
 - (d) pollution
82. The earth is the only suitable habitat we have, and its resources are
- (a) limited
 - (b) plenty
 - (c) finite
 - (d) exhaust
83. As people become educated, the population growth rate is
- (a) increased
 - (b) reduced
 - (c) large
 - (d) zero
84. How many percent of the solar energy reaching the Earth is absorbed on the earth's surface which increases its temperature.
- (a) 65%
 - (b) 70%
 - (c) 75%
 - (d) 80%
85. Carbon dioxide in the atmosphere has increased causing more heat to be trapped in
- (a) lower atmosphere
 - (b) upper atmosphere
 - (c) Subsurface
 - (d) green plants
86. Above the surface of the earth, Ozone layer forms between
- (a) 20 to 50kms
 - (b) 20 to 70kms
 - (c) 30 to 80kms
 - (d) 30 to 90kms
87. Ecosystems are divided into terrestrial or landbased ecosystems and
- (a) biotic ecosystem
 - (b) aquatic ecosystems
 - (c) wetland ecosystem
 - (d) atmospheric ecosystem

88. Nitrogen fixing bacteria and fungi in soil gives this important element to plants, which absorb it as
- (a) Nitric acid (b) Nitrites
(c) Nitrogen oxide (d) Nitrates
89. General term for particles suspended in air is
- (a) Aerosol (b) Smog
(c) Mist (d) Fume
90. Among Major Greenhouse Gases, the concentrations (ppb) highest is
- (a) Carbon dioxide (b) Methane
(c) Nitrous oxide (d) CFCs
91. Greenhouse gases trap heat in the form of infra-red radiation near the earth's surface is known as
- (a) Greenhouse Effect (b) Photosynthesis
(c) Photochemical Effect (d) Radiation Effect
92. Permissible noise level during day time in residential areas in India is
- (a) 45 dB (b) 55 dB
(c) 60 dB (d) 65 dB
93. EIA in India was first started in 1977-78 with evaluation of _____ projects.
- (a) industrial (b) hydropower
(c) road construction (d) river valley
94. Almost all projects were implemented with little or no environment concerns in India, till
- (a) 1970s (b) 1975s
(c) 1980s (d) 1985s
95. On 26 December, 2004 Great earthquake in Sumatra, Indonesia that killed almost _____ people.
- (a) 245,000 (b) 90,000
(c) 12,500 (d) 7,500
96. Shallow Earthquakes is the focal depth less than
- (a) 40 km (b) 50 km
(c) 70 km (d) 80 km
97. Tsunami in the deep water of the ocean may travel about the speed of
- (a) 200 km/h (b) 400 km/h
(c) 600 km/h (d) 800 km/h
98. A local flood of short duration generally resulting from heavy rainfall in the immediate vicinity is called
- (a) flash flood (b) urban flood
(c) river flood (d) coastal flood
99. Most of the landslide occurred in NE India is due to
- (a) earthquake (b) anthropogenic activity
(c) flood (d) erosion
100. Seismic Zone Map of India is divided into _____ seismic zones.
- (a) six (b) five
(c) four (d) three