

MIZORAM PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF
GEOLOGIST JUNIOR UNDER COMMERCE & INDUSTRIES DEPARTMENT,
GOVERNMENT OF MIZORAM, NOVEMBER, 2020

GEOLOGY PAPER - II

Time Allowed : 2 hours

Full Marks : 200

All questions carry equal mark of 2 each.
Attempt all questions.

1. Graphic texture is indicative of
 - (a) Eutectic crystallization
 - (b) Crystal Settling
 - (c) Fractional crystallization
 - (d) Magma mixing
2. Galena crystallizes in
 - (a) Monoclinic system
 - (b) Isometric system
 - (c) Trigonal system
 - (d) Triclinic system
3. Augite shows
 - (a) 1st order interference colours
 - (b) 2nd order interference colours
 - (c) 3rd order interference colours
 - (d) 4th order interference colours
4. Cleavage angles in pyroxene
 - (a) 84° and 96°
 - (b) 87° and 93°
 - (c) 80° and 100°
 - (d) 120°
5. Back-line method is used to determine the
 - (a) Birefringence
 - (b) Double refraction
 - (c) Refractive index
 - (d) Pleochroism
6. Which crystal systems have two optic axes?
 - (a) Orthorhombic and Monoclinic
 - (b) Orthorhombic, Monoclinic and Triclinic
 - (c) Monoclinic, Triclinic and Cubic
 - (d) Tetragonal, Cubic and Orthorhombic
7. The order of interference colour is determined by
 - (a) Quartz plate
 - (b) Gypsum plate
 - (c) Mica plate
 - (d) Calcite plate
8. A biaxial mineral is positive, if
 - (a) X is acute bisectrix
 - (b) Y is acute bisectrix
 - (c) Z is acute bisectrix
 - (d) Z is obtuse bisectrix
9. SCHORL is an aggregate of
 - (a) Tourmaline and quartz
 - (b) Tourmaline and calcite
 - (c) Tourmaline and corundum
 - (d) Tourmaline and emery

10. Which of the following forms of silica crystallizes in Monoclinic system?
 - (a) Milky quartz
 - (b) Rose quartz
 - (c) Rock crystal
 - (d) Averturine
11. The most common form of pyroxene is
 - (a) Basal pinacoid
 - (b) Front pinacoid
 - (c) Side pinacoid
 - (d) Prism
12. Which of the following mineral is a chain silicate?
 - (a) Augite
 - (b) Biotite
 - (c) Anorthite
 - (d) Olivine
13. How many metals are there in liquid form?
 - (a) 2
 - (b) 3
 - (c) 4
 - (d) 5
14. Isotopes are different elements with
 - (a) Same atomic numbers but different atomic mass
 - (b) Different atomic weights but same atomic numbers
 - (c) Different atomic weights and different atomic numbers
 - (d) Same number of neutrons but different number of protons in the nucleus
15. Tektites resemble
 - (a) Basalt
 - (b) Granodiorite
 - (c) Rhyolite
 - (d) Obsidian
16. The common type of pyroxene which occurs in meteorites is
 - (a) Hypersthene
 - (b) Enstatite
 - (c) Bronzite
 - (d) Jadite
17. The chemical bond existed in quartz is
 - (a) Covalent
 - (b) Ionic
 - (c) Metallic
 - (d) Vander wall
18. Rubidium is usually found dispersed in
 - (a) K- rich minerals
 - (b) Ca- rich minerals
 - (c) Na- rich minerals
 - (d) Al- rich minerals
19. The crust consists of
 - (a) About 95% of silicate minerals
 - (b) About 75% of silicate minerals
 - (c) Over 50% of quartz
 - (d) Over 50% of non-silicates
20. The average pH of the sea water is
 - (a) 5.2
 - (b) 6.5
 - (c) 7.0
 - (d) 7.8
21. Which of the following is an example of a Mafic rock containing plagioclase, titanium – bearing pyroxene and hornblende?
 - (a) Serpentine
 - (b) Essexite
 - (c) Ijolite
 - (d) Leucitite
22. Volcanic rocks are formed
 - (a) Between mantle
 - (b) On the surface of earth
 - (c) Under the surface of earth
 - (d) Inside the core

23. Which property of the rock reflected the rate of cooling of magma or lava?
(a) Density (b) Colour
(c) Texture (d) Mineralogy
24. Fine grained equivalent of plutonic syenite is
(a) Lherzolite (b) Dacite
(c) Aplite (d) Trachyte
25. Large crystals in pegmatite are formed due to
(a) Influence of cooling rate
(b) The presence of abundant volatiles in magma
(c) Very high pressure
(d) All of these
26. For a system at equilibrium the phase rule is denoted as
(a) $P + F = C + 1$ (b) $P + C = F + 1$
(c) $P + F = C + 2$ (d) $P + C = F + 2$
27. Which of the following is silica saturated rock?
(a) Granite (b) Diorite
(c) Sphene (d) Nepheline syenite
28. In plate tectonic settings, basalt are formed at
(a) Spreading center (b) Transform boundary
(c) Subduction zone (d) Continent-continent collision
29. A rock derived from the primary basaltic magma is characterized by
(a) Occurrence of olivine and clinopyroxene (b) Absence of olivine and feldspathoid
(c) Presence of clinopyroxene and quartz (d) Presence of feldspar and quartz
30. The gabbroic rock without pyroxenes containing mainly feldspars and olivine is
(a) Norite (b) Troctolite
(c) Dunite (d) Euclite
31. The correct sequence of rocks from top to bottom in an ophiolite is
(a) Gabbro – pillow basalt – dolerite dyke – radiolarian chert – peridotite
(b) Peridotite – pillow basalt – gabbro – dolerite dyke – radiolarian chert
(c) Pillow basalt – radiolarian chert – dolerite dyke – gabbro – peridotite
(d) Radiolarian chert – pillow basalt – dolerite dyke – gabbro – peridotite
32. Which one is not a discordant igneous body?
(a) Dyke (b) Sill
(c) Batholith (d) Pluton
33. Bowen's reaction series indicate the process of _____ in magma
(a) Fractional differentiation (b) Gravity separation
(c) Liquid immiscibility (d) Filter pressing
34. 'Pahoehoe' structure is related to
(a) Block lava (b) Ropy lava
(c) Pillow structure (d) Lava-drain tunnel

35. Ijolite is a
- (a) Felsic alkaline rock
 - (b) Mafic alkaline rock
 - (c) Ultramafic alkaline rock
 - (d) Volcanic rock
36. CIPW classification is essentially a
- (a) Mineralogical classification
 - (b) Chemical classification
 - (c) Textural classification
 - (d) Genetic classification
37. Which of the following volcanic rocks contain the highest percentage of silica?
- (a) Basalts
 - (b) Andesites
 - (c) Trachytes
 - (d) Rhyolites
38. Rocks that are dominantly composed of quartz can be classified on the basis of
- (a) ACF diagrams
 - (b) AKF diagrams
 - (c) AFM diagrams
 - (d) QAP diagrams
39. Myrmekite texture is produced by intergrowth of
- (a) Quartz and orthoclase
 - (b) Albite and oligoclase
 - (c) Plagioclase and augite
 - (d) Quartz and plagioclase
40. Pipes or narrow funnel-shaped bodies filled with accidental and gas-charged juvenile magmatic material are known as
- (a) Xenoliths
 - (b) Diatremes
 - (c) Mafurite
 - (d) Dike
41. Choose the correct sequence of deformation and metamorphism
- (a) Shale, slate, schist, phyllite, gneiss
 - (b) Shale, slate, phyllite, schist, gneiss
 - (c) Slate, shale, phyllite, schist, gneiss
 - (d) Slate, shale, schist, phyllite, gneiss
42. Mylonite represents
- (a) Dynamic metamorphism
 - (b) Regional metamorphism
 - (c) Burial metamorphism
 - (d) Contact metamorphism
43. Which one is completely unfoliated rock?
- (a) Slate
 - (b) Schist
 - (c) Phyllite
 - (d) Hornfels
44. Large scale metamorphism associated with increases in both temperature and pressure best defines
- (a) Contact metamorphism
 - (b) Burial metamorphism
 - (c) Partial melting
 - (d) Regional metamorphism
45. The process of conversion of glassy material into crystallised material is
- (a) Crystallisation
 - (b) Devitrification
 - (c) Eutectic processes
 - (d) Assimilation
46. The plagioclase + hypersthene + biotite mineral assemblages represent
- (a) Amphibolite facies
 - (b) Green schist facies
 - (c) Epidote facies
 - (d) Pyroxene – hornfels facies
47. Metamorphic grade refers to
- (a) Intensity of metamorphism
 - (b) Collection of mineral assemblage from rocks of various bulk composition that crystallised at same P, T condition
 - (c) Particular mineral observed at a specific P, T condition
 - (d) Specific P, T condition of metamorphism

48. _____ is the high temperature and high pressure metamorphic facies
- (a) Blueschist (b) Greenschist
(c) Eclogite (d) Amphibolite
49. Which one is not a metamorphic rock?
- (a) Hornfels (b) Orthoquartzite
(c) Metagranite (d) Biotite gneiss
50. The typical product of contact metamorphism with maculose structure is
- (a) Granulose (b) Cataclastic
(c) Hornfels (d) Schistose
51. Repetitive layering in metamorphic rocks is described as
- (a) Foliation (b) Lineation
(c) Schistosity (d) Gneissosity
52. Thermal metamorphism leads to
- (a) Change in mineralogical composition only
(b) Change in fabric only
(c) Change in mineralogical composition and fabric
(d) Non of these
53. Which of the following type of folds are commonly associated with migmatites?
- (a) Reclined folds (b) Ptygmatic folds
(c) Supratenuous folds (d) Piercing folds
54. Marble is transformed from
- (a) Sandstone (b) Quartz
(c) Limestone (d) Shale
55. Flaser rocks are the chief product of
- (a) Thermal metamorphism (b) Dynamothermal metamorphism
(c) Plutonic metamorphism (d) Cataclastic metamorphism
56. The *Staurloite Zone* is established by Barrow in restricted to rocks having high content of
- (a) Iron (b) Copper
(c) Magnesium (d) Manganese
57. The most common accessory mineral in eclogites is
- (a) Rutile (b) Zoisite
(c) Ilmenite (d) Sphene
58. The most commonly occurring silicates in metamorphic rocks are
- (a) Ionosilicates – Phyllosilicates – Tectosilicates
(b) Ionosilicates – Phyllosilicates – Nesosilicates
(c) Nesosilicates – Phyllosilicates – Tectosilicates
(d) Nesosilicates – Sorosilicates – Cyclosilicates
59. In Eskola's ACF diagram, 'F' represents
- (a) FeO (b) FeO + MgO
(c) FeO + MgO + MnO (d) FeO + MgO + MnO + CaCO₃

60. What happens to size of crystal during metamorphism?
- (a) They get smaller (b) They get larger
(c) No change in size (d) It is uncertain
61. Which of the following sedimentary structure could be used for determining top and bottom?
- (a) Planer cross bedding (b) Asymmetrical ripple marks
(c) Symmetrical ripple marks (d) None of these
62. Graded bedding is the result of deposition by
- (a) River (b) Blowing wind
(c) Moving ice (d) Turbidity currents
63. Syn-sedimentary deformation structures are a result of
- (a) Low sedimentation (b) High sedimentation
(c) Marine transgression (d) Marine regression
64. Sandstone containing $> 15\%$ matrix and $< 75\%$ quartz are classified as
- (a) Arkose (b) Greywacke
(c) Lithic arenite (d) Quartz arenite
65. Which of the following can be used to determine paleo-current direction?
- (a) Wave ripple (b) Mud cracks
(c) Current ripple (d) Parting lineation
66. Limestone and dolostone are distinguished by
- (a) Magnesia content (b) Lime content
(c) Alumina content (d) Soda content
67. The least stable material in elastic detritus is
- (a) Quartz (b) Olivine
(c) Amphibole (d) Hornblende
68. The dispersal patterns peculiar to the deltaic environments are
- (a) Unimodal (b) Bimodal
(c) Polymodal (d) Random
69. Minerals which is not readily weathered by chemical attack are
- (a) Reduzates (b) Resistates
(c) Hydrolysates (d) Oxidates
70. Bog iron ore is
- (a) Iron carbonate (b) Iron bicarbonate
(c) Iron oxide (d) Iron hydroxide
71. Walther's Law of Facies states that
- (a) Elimination of free oxygen from the sediments by bacterial action
(b) Characteristic associations of organic microfossils in rocks
(c) Vertical succession of facies reflects lateral changes in environment
(d) Deposition of minerals in the cavities and pore spaces
72. The evaporite that is typical of non-marine basins is
- (a) Gypsum (b) Halite
(c) Calcite (d) Trona

73. Glauconite is a
(a) K-Fe silicate (b) Na-Fe silicate
(c) K-Fe carbonate (d) Na-Fe carbonate
74. Ripple marks are best observed in
(a) Shale (b) Conglomerate
(c) Sandstone (d) Limestone
75. Diagenesis is a
(a) Syn-depositional change (b) Post-depositional change
(c) Pre-depositional change (d) None of these
76. Which type of coal is dominantly composed of algal and fungal matter?
(a) Lignite (b) Anthracite
(c) Cannel coal (d) Torbanite
77. Zircon and quartz usually occur as
(a) Unaltered minerals (b) Altered minerals
(c) Insoluble minerals (d) Soluble minerals
78. Arkose is derived from the disintegration of
(a) Gabbro (b) Granite
(c) Ultrabasic rocks (d) Marble
79. 'Shingle' is characteristic of _____ environment
(a) Littoral (b) Terrestrial
(c) Neritic (d) Abyssal
80. Chalk is a variety of
(a) Biosparite (b) Sparite
(c) Biomicrite (d) Stromatolite
81. In many earthquakes, mine workers below ground report less shaking than people on the surface because of
(a) Hollow space in the mine
(b) Double the amplitude of the upcoming waves
(c) Weathered rocks are available on the surface
(d) This statement is wrong
82. Which of the following tools are not used by environmental geologist
(a) Desk surveys (b) Field-based documentation
(c) Terrain analysis (d) Excavation process
83. Data from international scientific studies show that the earth's climate has been stable for the past
(a) 5000 years (b) 8000 years
(c) 10000 years (d) 12000 years
84. Earth has remained in the solar system's _____ where surface temperatures and atmospheric pressure allow liquid water to exist
(a) Habitable zone (b) Terrestria
(c) Blue giant (d) Water planet

85. A process that amplifies or increases a system's response to a change in the heat balance is
- (a) Negative climate feedback
 - (b) Sustained climate feedback
 - (c) Positive climate feedback
 - (d) Confirmed climate feedback
86. According to A.G. Tansely, ecosystem is comprised of
- (a) Biome and habitat
 - (b) Biome and province
 - (c) Biotic and abiotic
 - (d) Habitat and colony
87. The equilibrium model states that
- (a) Ecosystem always tends towards sustainability
 - (b) Ecosystem always tends towards stability
 - (c) Ecosystem always tends towards constancy of species
 - (d) Capacity to withstand changes by external factors
88. Nonpoint sources are those
- (a) Which release contaminants over a specific area and commonly consist of multiple sites
 - (b) Which release contaminants over a broad area and commonly consist of specific site
 - (c) Which release contaminants over a broad area and commonly consist of multiple sites
 - (d) Which release contaminants over a specific area and commonly consist of specific site
89. Any household, industrial or commercial waste which is collected and disposed of by local authorities is called
- (a) Recycled waste
 - (b) Supervised waste
 - (c) Managed waste
 - (d) Controlled waste
90. In river bank, erosion of outside banks is facilitated by the presence of _____ within the river
- (a) Primary current
 - (b) Secondary current
 - (c) Swollen current
 - (d) Rapid current
91. Vulnerability to coastal hazard is a function of the
- (a) Land use, population concentration and buildings located in the hazard zone
 - (b) Cliff face, storm surge and buildings infrastructure
 - (c) Storm surge, sea-level rise, erosion, and inlet migration
 - (d) Cliff rock formation, vegetation cover and sea level trends
92. A slope with a factor of safety of less than _____ is unstable and therefore in a condition of failure
- (a) One
 - (b) Two
 - (c) Three
 - (d) Four
93. Hazard maps are not static and may date quickly if
- (a) Mass displacement of sediment and rock occur
 - (b) Climate change increases or decreases weather hazards
 - (c) Land management and land use changes
 - (d) Shaking or displacement of ground due to earthquake manifestation
94. Liquefaction causes large fluid flow on slope greater than
- (a) 1°
 - (b) 2°
 - (c) 3°
 - (d) 4°

- 95.** A section of active fault zones where there has been little or no movement is known as
(a) Isoseismals (b) Seismic dilatancy
(c) Seismic corridor (d) Seismic gap
- 96.** The natural environmental system has a 'inbuilt self regulating mechanism' called
(a) Self-regulation mechanism (b) Homeostatic mechanism
(c) Reappraisal mechanism (d) Responsive mechanism
- 97.** The fourth-largest threat to human health, behind high blood pressure, dietary risks and smoking is
(a) Air pollution (b) Water pollution
(c) Noise pollution (d) Soil pollution
- 98.** 'Minamata Disease' is a type of disease caused by
(a) Asbestos poisoning (b) Mercury poisoning
(c) Lead poisoning (d) Arsenic poisoning
- 99.** The procedure of Environmental Impact Assessment of Leopold et al. suffers from the shortcoming
(a) It requires tremendous volume of paper work by requiring detailed reports which obscure the central and important issues
(b) Insertion of numerous information and reports makes the scheme confusing and it becomes difficult for the concerned authorities to pick up important but most relevant information.
(c) It has bias towards physical-biological environment
(d) All of these
- 100.** The most common magnitude scale is
(a) Local magnitude (ML) (b) Surface-wave magnitude (Ms)
(c) Body-wave magnitude (Mb) (d) Moment magnitude (Mw)

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