

- What is the temperature at the lithosphere-asthenosphere boundary?
A) 1300°C B) 1500°C
C) 1700°C D) 1900°C
- Which materials are dated in Speleochronology?
A) Microfossil shells B) Zircon crystals with overgrowths
C) Deep ocean deposits D) Cave deposits
- Which of the following marks a knick point?
A) The highest point of a mountain or hill
B) A rapid fall in seismic velocity
C) An abrupt change in the longitudinal profile of a stream
D) A region where two or more glaciers meet
- Which of the following geomorphic features represents the sea-ward end of a deeply excavated glacial trough valley?
A) Kettle B) Moraine
C) Hogback D) Fjord
- To which of the following processes the Campbell's law is related?
A) Deposition in turbidity currents
B) Migration of drainage divides
C) Propagation of seismic waves
D) Breaking of waves along coast
- Which type of radar is used in the German satellite TanDEM-X?
A) SAR B) SLAR
C) ISAR D) GPR
- Which co-ordinate system is used by GPS?
A) WGS 64 B) WGS 72
C) WGS 84 D) WGS 94
- The GTOPO digital elevation model is with a resolution of 30 arcsecond. How much is its resolution for elevation?
A) 0.5 km B) 1 km
C) 1.5 km D) 3 km
- Which of the following is open source GIS software?
A) ArcGIS B) MapInfo
C) GRASS GIS D) Smallworld

10. As per the Anderson's theory of faulting, which kind of fault will take place if the intermediate stress axis is vertical?
- A) Normal fault B) Reverse fault
C) Strike-slip fault D) Thrust
11. In which type of unconformity the older rocks are crystalline in nature?
- A) Angular unconformity B) Nonconformity
C) Disconformity D) Paraconformity
12. Which of the following is not indicative of younging direction?
- A) Cross bedding B) Graded bedding
C) Convolute lamination D) Pillow lavas
13. What is the true dip of a plane which has apparent dips of 40° towards $N45^\circ E$? and 25° towards $N60^\circ W$?
- A) 50° due North B) 60° due North
C) 50° due South D) 60° due South
14. To which of the following Z-fold is associated with:
- A) Dextral shear B) Sinistral shear
C) Thrust D) Rift
15. Where do you observe plumose structure?
- A) Along ductile shears
B) Along axial planes of folds
C) Along joint surfaces
D) Along bedding planes in slate
16. Which is the northern hemispheric counterpart of Gondwanaland?
- A) Pangea B) Rodinia
C) Laurasia D) Panthalassa
17. Which of the following is synonymous with Variscan orogeny?
- A) Hercynian B) Caledonian
C) Alpine D) Himalayan
18. Which of the following gives the morphology of island arcs?
- A) Convex toward continent
B) Convex toward Open Ocean
C) Convex toward the nearby ridge
D) Convex toward nearby orogenic belt
19. How many years ago did the last geomagnetic reversal take place?
- A) 7,800 B) 78,000
C) 7,80,000 D) 78,00,000

20. Where do you find the application of Euler's rotation theorem?
 A) Phase relations in minerals
 B) Crystallography and symmetry operations
 C) Optical mineralogy and rotation of polars
 D) Paleomagnetism and plate reconstructions
21. What is the confining pressure at the base of a 35km thick continental crust?
 A) 5 Kb B) 10 Kb C) 15 Kb D) 20 Kb
22. The boundary between Palaeogene and Neogene is around:
 A) 13 Ma B) 23 Ma C) 33 Ma D) 43 Ma
23. What is the chronostratigraphic unit corresponding to the time unit epoch?
 A) System B) Period C) Series D) Stage
24. Which of the following has undergone high-grade metamorphism?
 A) Shimoga Schist Belt B) Kolar Schist Belt
 C) Sargur Schist Belt D) Kerala Khondalite Belt
25. Which of the following schist belts in Karnataka is equivalent to Wynad Schist belt?
 A) Dharwars B) Sargurs C) Kolar D) Shimoga
26. Which of the following is the youngest?
 A) Cretaceous B) Carboniferous
 C) Cambrian D) Jurassic
27. Which of the following is a platformal basin?
 A) Siwalik basin B) Cambay basin
 C) Cuddappah basin D) Cauvery basin
28. What is the age of Carditabeaumonti beds?
 A) Cenomanian B) Maestrichian C) Turonian D) Danian
29. Which of the following is the correct arrangement in terms of geologic age?
 A) Closepet granite- Rajmahal traps - Deccan traps- Barren Island volcanics
 B) Deccan traps- Closepet granite - Barren Island volcanics- Rajmahal traps
 C) Closepet granite - Deccan traps- Rajmahal traps - Barren Island volcanics
 D) Barren Island volcanics-Deccan traps-Closepet granite- Rajmahal traps
30. Which of the following is the correct arrangement in terms of geologic age?
 A) Kurnools -Talchirs- Quilon beds - Siwaliks- Karewas
 B) Talchirs -Kurnools - Quilon beds - Siwaliks- Karewas
 C) Kurnools -Talchirs- Quilon beds - Karewas- Siwaliks
 D) Kurnools -Quilon beds - Talchirs - Siwaliks- Karewas

31. What is the age of break-up of Seychelles from the Indian continent?
 A) 53 Ma B) 63 Ma
 C) 73 Ma D) 83 Ma
32. Which of the following is not massif-type anorthosite?
 A) Sithanpundi B) Oddanchatram
 C) Bolangir D) Perinthatta
33. Which of the following minerals is chemically similar to Leucoxene?
 A) Monazite B) Ilmenite C) Rutile D) Garnet
34. Which among the following Gondwana fossils is not a plant fossil?
 A) Gondwanoblatta B) Neomariopteris
 C) Vertebraria D) Dicordium
35. To which group the Gulcheru Quartzites belong to:
 A) Semri B) Papaghni
 C) Nallamalai D) Rewa
36. To which of the following 'Blastoid' belongs to?
 A) Trilobite B) Cephalopod
 C) Echinoderm D) Graptolite
37. With which of the following, the newly identified human-like species 'Homo naledi' resembles?
 A) Sivapithecus B) Limnopithecus
 C) Afropithecus D) Australopithecus
38. When did Moretherium, the ancestors of modern elephant first appear on the Earth?
 A) Paleocene B) Eocene C) Oligocene D) Miocene
39. What is the approximate number of trilobite species recognized so far?
 A) 2000 B) 5000 C) 10000 D) 20000
40. To which phylum cephalopods belongs to?
 A) Protozoa B) Colentera
 C) Mollusca D) Arthropoda
41. To which phylum, the class 'Crustacea' belongs to:
 A) Protozoa B) Coelentarta
 C) Mollusca D) Arthropoda
42. To which modern animal the Eohippus is ancestral?
 A) Elephant B) Zebra
 C) Horse D) Hippopotamus

43. Which of the following is not an ammonoid?
A) Orthoceras B) Phylloceras
C) Ceratites D) Goniatites
44. What is the term denoting the contact between a septum with the inner surface of the shell-wall of a cephalopod?
A) Septal line B) Siphuncle
C) Suture line D) Shell line
45. Where will be the position of the face 0001 on a Hexagonal crystal stereogram?
A) At the centre of the stereogram
B) At the primitive circle
C) Mid-point between the centre and primitive circle along the E-W diagonal
D) Mid-point between the centre and primitive circle along the N-S diagonal
46. To which crystal system the class with no symmetry belongs to?
A) Triclinic B) Trigonal
C) Monoclinic D) Orthorhombic
47. How many crystal classes are there in the Tetragonal System?
A) 4 B) 5 C) 6 D) 7
48. To which crystal system the point group with symbol 432 belongs to?
A) Isometric B) Tetragonal
C) Hexagonal D) Orthorhombic
49. How many enantiomorphic crystal classes are there in total?
A) 8 B) 9 C) 10 D) 11
50. By what name the side pinacoid parallel to the vertical axis and shorter lateral axis is called?
A) Brachy pinacoid B) Macro pinacoid
C) Clino pinacoid D) Ortho pinacoid
51. Which of the following minerals is isotropic under the petrological microscope?
A) Hypersthene B) Almandine
C) Fosterite D) Cordierite
52. Which of the following mineral property is detected using 'Becke test'?
A) Birefringence B) Retardation
C) Refractive index D) Anorthite content
53. Which of the following commonly shows pleochroic haloes?
A) Sapphirine B) Kornerupine C) Cordierite D) Staurolite
54. What is the retardation of a Gypsum Plate?
A) 100 nm B) 275 nm C) 550 nm D) 1100 nm

55. Which of the following is a phyllosilicate?
A) Tourmaline B) Spodumene
C) Leucite D) Kaolinite
56. What name is to be give to a pyroxene with 20% Wo, 30% Fs and 50% En molecules?
A) Augite B) Ferroaugite
C) Subcalciaugite D) Pigeonite
57. Which of the following is not the correct pair of mineral species and corresponding mineral family?
A) Adularia: Feldspar B) Spodumene : Pyroxene
C) Piemontite : Amphibole D) Paragonite : Mica
58. What is the specific gravity of baryte?
A) 4.5 B) 5.5 C) 6.5 D) 7.5
59. Match the following sets of minerals with their chemical groups:
1. Barite a. Oxide
2. Cuprite b. Sulphide
3. Siderite c. Sulphate
4. Marcasite d. Carbonate
5. Monazite e. Phosphate
A) 1-a; 2-b; 3-c; 4-d; 5-e B) 1-c; 2-a; 3-d; 4-b; 5-e
C) 1-c; 2-a; 3-b; 4-d; 5-e D) 1-d; 2-e; 3-c; 4-b; 5-a
60. The phase diagram of which mineral group is established by Swamy and Saxena (1994)?
A) Clinopyroxenes B) Orthopyroxenes
C) Silica polymorphs D) Carbon-Diamond
61. In which crystal system the mineral hypersthene crystallizes?
A) Tetragonal B) Orthorhombic
C) Monoclinic D) Triclinic
62. What are the essential chemical features of basaltic hornblende?
A) Low ferric to ferrous ratio and low hydroxyl content
B) High ferric to ferrous ratio and low hydroxyl content
C) Low ferric to ferrous ratio and high hydroxyl content
D) High ferric to ferrous ratio and high hydroxyl content
63. Which of the following is not a polymorphous pair?
A) Coesite and Stishovite B) Anatase and Brookite
C) Sanidine and Adularia D) Rutile and Ilmenite

64. What does the acronym KREEP stand for?
 A) Meteorite B) Upper mantle rock
 C) Lunar rock D) Chondrite-normalized REE pattern
65. Which of the following is a high-field-strength (HFS) element?
 A) Ni B) Cr C) Co D) Zr
66. Which of the following is not a Large-Ion-Lithophile (LIOL) element?
 A) K B) Rb C) Eu D) Sr
67. What is the age of oldest zircon dated from crustal rocks?
 A) 4.2 Ga B) 4.4 Ga C) 4.6 Ga D) 4.8 Ga
68. In which of the following constituents the heavy water is characteristically enriched in?
 A) Protium B) Deuterium
 C) Tritium D) Uranium
69. Which of the following is a peritectic crystallization?
 A) Orthopyroxene to Clinopyroxene
 B) Olivine to Orthopyroxene
 C) Pyroxene to Hornblende
 D) Pyroxene to Garnet
70. What is the age of the Mackenzie dyke swarm and the associated Large Igneous Province?
 A) Archean B) Proterozoic
 C) Paleozoic D) Mesozoic
71. Which texture is associated with anorthosite?
 A) Symplectite B) Spinifex C) Corona D) Cumulus
72. Granite differs from Basalt in terms of:
 A) Chemistry and texture but not mineralogy
 B) Chemistry and mineralogy but not texture
 C) Texture and mineralogy but not chemistry
 D) Chemistry, texture and mineralogy
73. A plutonic rock with 30% quartz, 50% microcline and 20% biotite can be named as:
 A) Granite B) Syenite
 C) Alkali-Feldspar Granite D) Granodiorite
74. Which is the most abundant mineral in crustal rocks?
 A) Quartz B) Pyroxene
 C) K-feldspar D) Plagioclase

75. What is the volcanic equivalent of Syenite?
 A) Trachyte B) Latite
 C) Dacite D) Andesite
76. Which of the following magmatic series is typical of early rift settings?
 A) Komatiitic B) Tholeiitic
 C) Alkaline D) Calc-alkaline
77. The silica and alkali contents of five volcanic rocks are given below. Assign appropriate names to them:

Sl. No.	SiO ₂ wt%	(Na ₂ O+K ₂ O) wt. %
1	50	3
2	55	4
3	60	5
4	75	10
5	65	12

- A) 1-Basalt; 2-Andesite; 3-Basaltic Andesite; 4-Rhyolite; 5-Trachyte
 B) 1-Andesite; 2-Phonolite; 3-Dacite; 4-Felsite; 5-Rhyolite
 C) 1-Basalt; 2-Basaltic Andesite; 3-Andesite; 4-Rhyolite; 5-Trachyte
 D) 1-Basalt; 2-Andesite; 3-Dacite; 4- Rhyolite; 5-Latite
78. Name the plutonic rock with 30% quartz, 50% microcline 10% oligoclase and 10% hypersthene.
 A) Monzonite B) Adamellite
 C) Enderbite D) Charnockite
79. Which of the following group of rocks is described by Bouma sequence?
 A) Komatiites B) Lamprophyres
 C) Turbidites D) Mylonites
80. Which is the typical authigenic mineral in green sand?
 A) Fuchsite B) Chlorite
 C) Glaucofanite D) Glauconite
81. What is the minimum content of foraminiferal test in Globigerina ooze?
 A) 90% B) 70% C) 50% D) 30%
82. Which of the following parameters define the asymmetry of a frequency distribution?
 A) Standard deviation B) Skewness
 C) Kurtosis D) Median
83. To which facies of metamorphism a rock recrystallized at 600°C temperature and 6 Kb pressure can be assigned to?
 A) Greenschist B) Amphibolite
 C) Granulite D) Eclogite

84. Which of the following process take place during amphibolite to granulite transition?
 A) Retrogression B) Dehydration
 C) Metasomatism D) Anatexis
85. Which of the following is metamorphic mineral deposit?
 A) Diamond B) Chrysoberyl
 C) Graphite D) Monazite
86. Who coined the name 'kodurite' to the manganiferous rocks of Srikakulam District?
 A) Bruce Foot B) Thomas Holland
 C) Lewis Fermor D) M.S.Krishnan
87. Which of the following is a probable precursor for calc-granulites?
 A) Charnockites B) Mafic volcanics
 C) Impure limestone D) Carbonaceous clay
88. Peridotite is mineralogically
 A) Olivine and Muscovite B) Olivine and Pyroxenes
 C) Pyroxenes and Feldspars D) Olivine alone
89. Match the economic deposits in **Group I** with their Indian occurrences in **Group II**.
- | <u>Group I</u> | <u>Group II</u> |
|-----------------------|------------------------|
| P. Lignite | 1. Malanjkhand |
| Q. Copper | 2. Narwapahar |
| R. Uranium | 3. Sukinda |
| S. Chromite | 4. Neyveli |
- A) P-4, Q-1, R-2, S-3 B) P-4, Q-3, R-2, S-1
 C) P-4, Q-2, R-1, S-3 D) P-3, Q-1, R-2, S-4
90. What is the principal ore in gonditic type manganese deposit?
 A) Pyrolusite B) Psilomelane
 C) Braunite D) Manganite
91. What is the principal ore in iron ore deposit of Salem?
 A) Magnetite B) Hematite C) Siderite D) Goethite
92. Which deposit gives the best quality coal in India?
 A) Barakar B) Singareni C) Raniganj D) Jharia
93. What do the alternate bands in marine polymetallic nodules represent?
 A) Deposits of alternate seasons
 B) Organic carbon rich and free layers
 C) Layers enriched in iron and manganese
 D) Grain size variations

106. What is the approximate velocity of seismic waves in granitic crust?
 A) 6 km/s B) 8 km/s
 C) 10 km/s D) 12 km/s
107. Which electrode configuration is suitable for quick assessment of vertical change in resistivity at shallow depths?
 A) Schrumberger array B) Wenner array
 C) Dipole-dipole array D) Pole-dipole array
108. For which geophysical exploration SQUID is an equipment?
 A) Gravity B) Magnetic
 C) Seismic D) Electromagnetic
109. Water with 50ppm Ca can be classed as:
 A) Soft water B) Moderately Hard water
 C) Hard water D) Very hard water
110. Match the economic deposits in **Group I** with their place of occurrence in Kerala in **Group II**.
- | <u>Group I</u> | <u>Group II</u> |
|-----------------------|-----------------------|
| P. Scheelite | 1. Kozhikode |
| Q. Graphite | 2. Kundara |
| R. Iron ore | 3. Kanjirappalli |
| S. Clay | 4. Attappady |
| A) P-4, Q-1, R-2, S-3 | B) P-4, Q-3, R-1, S-2 |
| C) P-4, Q-2, R-1, S-3 | D) P-3, Q-1, R-2, S-4 |
111. What is the range in porosity of sandstones?
 A) 0.02 – 0.15 B) 0.03 – 0.20
 C) 0.04 – 0.025 D) 0.05 – 0.30
112. Which of the following is basic assumption in Darcy's law?
 A) Velocity is uniform and porosity is less than 0.5
 B) Porosity is uniform and water density is 1
 C) Gradient is low and the dissolved material is negligible
 D) Flow is laminar and the inertia is negligible
113. The presence of which of the following contaminants in drinking water is related to the risk of causing cancer?
 A) Fluoride B) Lead
 C) Arsenic D) Cadmium
114. In which of the following activities, hydraulic fracturing is employed?
 A) Construction of dam B) Hydrocarbon production
 C) Tunneling D) Groundwater exploration

115. What does the term 'long wall' stands for in Applied Geology?
A) A technique of underground mining
B) Construction of embankment in opencast mining
C) Construction of dam
D) Ore beneficiation technique
116. Why most of the atomic power plants are uranium-based and not thorium-based?
A) Lack of technology
B) Environmental concerns
C) Scarcity of thorium
D) Enhanced weapon proliferation
117. What is the advantage of carbon sequestration?
A) Checking global warming
B) Future reserve of fossil fuel
C) Production of artificial graphite
D) Generating thermal power
118. Which of the following is not for mitigation of coastal erosion?
A) Revetments
B) Gabions
C) Groines
D) Dredging
119. In supply of which of the following the state of Kerala stands first in the country?
A) Limeshell
B) Clay
C) Ilmenite
D) Glass sand
120. The dam which was affected due to reservoir induced seismicity:
A) Mullaperiyar Dam
B) Mettur Dam
C) Koyna Dam
D) Tehri Dam
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