A

22111 **120 MINUTES**

1. The infiltration capacity of soil depends on:
   A) Total amount of voids in the soil
   B) Shape and size of soil particles
   C) Arrangement of soil particles
   D) All the above

2. Sinkholes are found in regions underlain by:
   A) Sandstone B) Limestone C) Granite D) Shale

3. The three key metals in great demand to make Electric Vehicle (EV) batteries.
   A) Manganese, Lithium and Nickel
   B) Manganese, Cobalt and Zinc
   C) Manganese, Zinc and Lithium
   D) Lithium, Nickel and Cobalt

4. A mineral which is used in the manufacture of paints, chemical industry and oil well drilling:
   A) Barite B) Quartz C) Feldspar D) Magnesite

5. Longwall mining is employed in the extraction of :
   A) Copper ore B) Coal C) Lignite D) Iron ore

6. In a fully saturated soil sample the volume of voids equal to the volume of:
   A) air
   B) air and volume of water
   C) water
   D) solids and water

7. Stubble burning produces ---------gas/es.
   A) CO B) CO_2
   C) Oxides of Sulphur D) All the above

8. Stream velocity is greatest ------.
   A) in midstream near the stream bed
   B) along the stream banks
   C) along the stream bed
   D) in midstream near the surface

9. The country where there was near continuous volcanic eruptions since March, 2021:
   A) Spain B) Italy C) Philippines D) Iceland

10. Mullaperiyar dam is a -------- dam.
    A) Gravity B) Arch
    C) Buttress D) None of these

11. Ringwoodite and Wadsleyite, found in the upper mantle of the earth, are polymorphs of:
A) $CaTiO_3$ B) $MgSiO_3$ C) Mg_2SiO_4 D) Fe_2SiO_4

12. ------- is a silicate mineral.
A) Monazite B) Chrysoberyl
C) Hemimorphite D) Rhodocrocite

13. The exoskeleton of trilobites were made of:
A) Chitinous material B) Calcareous material
C) Siliceous material D) None of these

14. The diameter of pebble in Wentworth Scale:
A) Between 4 and 64mm B) Between 2 and 4 mm
C) Between 64 and 256 mm D) Between 0.5 and 2 mm

15. Which one among the following is **not** a shear sense indicator?
A) Mica fish B) Foliation patterns
C) Mineral veins D) Joints

16. The Exclusive Economic Zone (EEZ) extends seaward from the baseline (coast) to a maximum of -------km.
A) 170 B) 120 C) 370 D) 200

17. The opening through which miners enter an underground mine
A) Shaft B) Adit C) Tunnel D) Drift

18. The major type of environment in which Lower Gondwana Group of rocks were deposited:
A) Fluviatile B) Lacustrine C) Marine D) Volcanic

19. The number of faces in a Positive Rhombohedron:
A) 12 B) 24 C) 4 D) 6

20. The stratigraphic equivalents of Upper Vindhyans in Southern India:
A) Lower Bababudan Group B) Bhima Group
C) Sargur Group D) Upper Kurnool Group

21. The minerals commonly seen in lunar rocks.
A) Pyroxene and Olivine B) Olivine and Amphibole
C) Pyroxene and Quartz D) Pyroxene and Biotite

22. Which one of the following statements is correct about a meandering river?
A) Meander is formed at the youthful stage of a river
B) Playas are associated with meanders
C) Erosion takes place at the concave part of a meander
D) Perennial rivers do not show meanders

23. A line on a map connecting points of equal gravity values on the earth's surface.
A) Isogon B) Isogal C) Isohypse D) Isohyet

24. -------- of a sensor system is its capability to discriminate two closely spaced objects from each other

A) Texture B) Tone
C) Resolution D) Magnification

25. The average width of the continental slope

A) 10 km B) 40 km C) 30 km D) 20 km

26. Which among the following is a large-scale map?

A) 1:1000000 B) 1:100000 C) 1:50000 D) 1:10000

27. Mie scattering is caused by:

A) Dust and fog B) Air molecules
C) Smoke and Haze D) None of these

28. Phobos and Deimos are the two natural satellites of:

A) Saturn B) Mercury C) Mars D) Jupiter

29. Transpression fault is a type of ---------- fault.

A) Strike-slip B) Dip-slip C) Oblique-slip D) Diagonal-slip

30. Which among the following is **not** correct about geostationary satellites?

A) Orbit at an altitude of 35786 km
B) Makes one revolution in 24 hours
C) Synchronous with the Sun's rotation
D) Coverage is limited to 70^0 N to 70^0 S

31. The typical secondary sulphide ore of copper

A) Bornite B) Chalcocite C) Tetrahedrite D) Covellite

32. Match the following:

a.	Chenier ridge	1.	Glacial
b.	Arete	2.	Aeolian
c.	Bolson.	3.	Fluvial
d.	Natural levee	4.	Beach

A) a-3, b-4, c-2, d-1 B) a-3, b-1, c-4, d-2
C) a-4, b-1, c-2, d-3 D) a-2, b-4, c-1, d-3

33. Pandarettu deposit in Palakkad district of Kerala contains:

A) Iron ore B) Muscovite
C) Crystalline limestone D) Graphite

34. Scheelite, ferberite and huebnerite are ores of:

A) Platinum B) Bismuth C) Antimony D) Tungsten

35. Aquamarine is a gem variety of :

A) Topaz B) Beryl C) Corundum D) Chrysoberyl

36. Which one of the following is **not** a basic refractory mineral?
A) Kyanite B) Dolomite C) Magnesite D) Chromite

37. Which one of the following is **not** a passive geophysical method of exploration?
A) Self-potential method B) Gravity method
C) Magneto-telluric method D) Electrical Resistivity method

38. Bouma Sequence is a characteristic sequence of sedimentary structures occurring in:
A) Pyroclasts B) Ophiolites
C) Glacio-fluvial deposits D) Turbidites

39. Presence of more than one kind of bond in a single mineral makes it:
A) Homodesmic B) Heterodesmic
C) Dibondic D) Polydesmic

40. *Ocimum centraliafricanum* is an indicator plant for ---------- deposits.
A) Zinc B) Manganese C) Copper D) Gold

41. Which one among the following is **not** correct about the earth?
A) The polar diameter is lesser than the equatorial diameter
B) The surface area of the earth is 510.1million km^2
C) The average radius of the earth is 6371km
D) The average density of the earth is 3.51gm/cm^3

42. "The degree and direction of the pitch of a fold are often indicated by those of the axes of the minor plications on its side"
A) Ramsay's Rule B) Pumpelly's Rule
C) Rule of V's D) Donath and Parker Rule

43. Red Sea is an example of ---------- structure.
A) Faulted B) Folded
C) Erosional D) Residual volcanic

44. Choose the correct statement :
A) Vector methods are preferred for network analysis
B) Vector methods are preferred for quick and cheap overlay
C) Raster data structure is preferred for high quality line drawing
D) Accurate geographic location of data is maintained

45. Point of zero curvature, where the sense of curvature of a fold changes from a convex to a concave line:
A) Inflection Point B) Crest
C) Hinge D) Trough

46. Surface Seismic waves that propagate on the earth's surface in a rolling motion similar to that of ocean waves
A) Rayleigh waves B) Love waves
C) Secondary waves D) Shear waves

47. Spinifex texture is characteristic of :
A) Ophiolites B) Komatiites
C) Carbonatites D) Phonolites

48. A source of magma located within a plate and away from plate boundaries:
A) Magma pool B) Lava Pool
C) Hotspot D) Magma dome

49. Match the lithostratigraphic units with their Geologic Age.

a. Patcham Formation	1. Mio-Pliocene
b. Cumbum Formation	2 Upper Cretaceous
c. Cuddalore sandstone Formation	3. Jurassic
d. Nimar sandstone Formation	4. Proterozoic

A) a-4, b-1, c-3, d-2 B) a-3, b-4, c-1, d-2
C) a-1, b-4, c2, d-3 D) a-4, b-2, c-1, d-3

50. --------- was a super continent which existed at about 1.1 billion years ago.
A) Gondwanaland B) Pangaea
C) Rodinia D) Panthalassa

51. An exceptionally rich shoot or bunch of ore is called:
A) Lode B) Pitch C) Flat D) Bonanza

52. High pressure environment results in:
A) Open structures
B) Compact structures
C) Both compact and open structures,
D) Dense structures.

53. The process of formation of chromite:
A) Magmatic differentiation B) Hydrothermal cavity filling
C) Residual Concentration D) Hydrothermal replacement

54. Froth Floatation Process is used for the separation of metal/s from ------ores
A) Oxide B) Sulphide C) Silicate D) Sulphate

55. The oxide ore mineral found in the beach sands of Kerala:
A) Zircon B) Ilmenite C) Monazite D) Garnet

56. Platinum occurs only in --------.
A) Acid rocks to intermediate rocks
B) Intermediate rocks.
C) Basic rocks.
D) Mafic to Ultrabasic rocks.

57. Match the following:

a. Stockworks.	1. Mineralization along the crests of anticlines.
b. Saddle reefs.	2. Transverse and nearly parallel fractures filled with ore.
c. Ladder veins.	3. Interlacing network of ore-bearing veinlets.
d. Gash veins.	4. Small wedge-shaped fissures filled with the ores.

A) a-2, b-1, c-3, d-4 B) a-1, b-2, c-3, d-4
C) a-3, b-1, c-2, d-4 D) a-4, b-3, c-2, d-1

58. The mineral which shows negative relief:
A) Leucite B) Quartz C) Diamond D) Sillimanite

59. Choose the one with increasing order of specific gravity:
A) Siderite, Magnesite, Dolomite, Calcite
B) Calcite, Magnesite, Siderite, Dolomite
C) Calcite, Dolomite, Magnesite, Siderite
D) Calcite, Siderite, Magnesite, Dolomite

60. DTH method is suitable for drilling deep water wells in --------.
A) Soft sediments
B) Soft Sedimentary rocks
C) Hard igneous and metamorphic rocks
D) Unconsolidated sediments

61. The Indian Himalayan Region passes through ----------.
A) Haryana, Uttarakhand, Himachal Pradesh, Arunachal Pradesh
B) Arunachal Pradesh, Manipur, Jharkhand, Meghalaya
C) Manipur, Meghalaya, Mizoram, Nagaland, Sikkim
D) Rajasthan, Punjab, Haryana, Himachal Pradesh, Uttarakhand

62. Which among the following is correct?
A) In cross –cutting veins the least continuous one is the youngest
B) Inclusions are older than the rocks in which they are found
C) Intrusions are older than the rocks that have been affected by intrusion
D) The rocks above an unconformity are older than the unconformity

63. In which following Period of the Geologic Time did flowering plants appear?
A) Carboniferous B) Devonian
C) Cretaceous D) Triassic

64. Which one of the following has lithostratigraphic units only?
A) Bed-System-Formation-Group
B) Supergroup-Group-Formation-Bed
C) Period -Member-Group-Supergroup
D) Member-Zone-Era-Formation

65. In a stress ellipsoid
A) the axes are proportional in length and parallel to the principal stress vectors
B) the axes are proportional in length and perpendicular to the principal stress vectors
C) the axes are proportional in length and parallel / perpendicular to the principal stress vectors
D) the axes need not be proportional in length or parallel to the principal stress vectors

66. Contact aureole is commonly found around metamorphosed ----------
A) Ferruginous rocks B) Calcareous rocks
C) Argillaceous rocks D) Basalt

67. Which one of the following is **not** an index fossil?
A) Ammonites B) Trilobites
C) Nautiloids D) Graptolites

68. Gulcheru Quartzite formation belongs to ---------Supergroup.
A) Delhi B) Cuddapah C) Vindhyan D) Dharwar

69. Face-centred Bravais lattice is seen in ---------- system/s.
A) Cubic and Orthorhombic B) Tetragonal and Orthorhombic
C) Cubic and Tetragonal D) Cubic and hexagonal

70. Which one of the following statement is **not** true about the Geology of Kerala?
A) Equivalents of Sargur schists are found in North Kerala
B) All the charnockites of Kerala are of metamorphic origin
C) Quilon formation is of Middle Miocene age
D) Basic dykes of Cretaceous age are found in Palakkad district

71. Which among the following is **not** correct about Inductively Coupled Plasma Mass Spectrometry (ICP-MS):
A) Can detect concentration of each element at ppm level
B) Can detect all elements at once
C) Cannot measure the individual isotopes of each element
D) Uses simple spectra

72. Long -term changes in the geochemical cycle:
A) Periodic changes B) Perennial changes
C) Constant changes D) Secular changes.

73. If the content of fluoride is > ---- /litre in drinking water, it harmfully affects the teeth and bones in human beings.
A) 1.5 mg B) 0.5 mg C) 1.0 gm D) 1.25 mg

74. Which one of the following statements is **not** true about water table?
A) Water table changes when discharge is not balanced by recharge
B) Water table is depressed near wells from which large amount of water is pumped
C) Water table does not follow topography
D) Water table is above the ground surface in lakes

75. In the Moh's Scale of Hardness there are ---------- silicate minerals.
A) 4 B) 5 C) 3 D) 6

76. Turbidites are commonly associated with ---------- environment.
A) Lacustrine B) Aeolian C) Deep Marine D) Fluvial

77. In which of the following system does maximum number of solids crystallize?
A) Monoclinic B) Orthorhombic
C) Isometric D) Tetragonal

78. ------ does not find a place in the list of Salic minerals in C I P W norm.
A) Corundum B) Microcline C) Nepheline D) Leucite

79. Arsenic, antimony, tellurium, selenium and mercury are considered as pathfinder elements for:
A) Chromium B) Copper C) Gold D) Platinum

80. Which among the following does not belong to the amphibole group?
A) Glaucophane B) Grunerite C) Glauconite D) Gedrite

81. Choose the mineral with **four** sets of cleavages
A) Sphalerite B) Fluorite C) Calcite D) Orthoclase

82. The sequence in which the minerals are formed in an ore deposit is called:
A) Paragenesis B) Reaction Series
C) Facies D) Zoning

83. The most abundant non-metal in the crust of the earth:
A) Nitrogen B) Magnesium C) Oxygen D) Hydrogen

84. Fission Track dating method is used in -------- bearing minerals.
A) Uranium B) Thorium C) Potassium D) Rubidium

85. Minette, Kersantite, Vogesite and Spessartite are different types of:
A) Carbonatite B) Lamprophyre
C) Anorthosite D) Gabbro

86. The type of basalts which are typically associated with hotspots:
A) Normal Mid Ocean Ridge Basalts (N-MORB)
B) Orogenic basalts
C) Ocean Island Basalts (OIB)
D) None of these

87. An intrusive form parallel to the bedding plane or foliation of folded country rock
A) Laccolith B) Cone sheet C) Lopolith D) Phacolith

88. How many principal sections are there for a uniaxial crystal?
A) 3 B) 2 C) 4 D) 1

89. The system which has melts analogous in composition to simplified anhydrous basaltic magmas:
A) Nepheline-Albite-Anorthite B) Diopside-Anorthite-Albite
C) Albite-Orthoclase-Anorthite D) Diopside-Forsterite-Silica

90. Which among the following is **not** true about High Field Strength Elements?
A) Have high charge B) Are typically incompatible
C) Have a large ionic radius D) TA, Zr, Hf, Nb are examples

91. Assertion (A) : Minerals crystallizing in the isometric system are optically isotropic
Reason (R).: All sections of uniaxial and biaxial minerals are anisotropic

A) Both A and R are true and R explains A
B) Both A and R are true but R does not explain A
C) A is true but R is false
D) A is false but R is true

92. In tabling (ore beneficiation)----------of particles is made use of
A) Gravity B) Electrical conductivity
C) Magnetic property D) Surface tension

93. Assertion (A) : Petroleum is found only in Tertiary rocks in India
Reason (R).: Rotary drills are used for extraction of petroleum
A) Both A and R are true and R explains A
B) Both A and R are true but R does not explain A
C) A is true but R is false
D) A is false but R is true

94. Assertion (A) : Thick lignite seams are mined at Neyveli from Cuddalore formation
Reason (R).: Thin lignite seams are found in Quilon formation of Kerala
A) Both A and R are true and R explains A
B) Both A and R are true but R does not explain A
C) A is true but R is false
D) A is false but R is true

95. Assertion (A) : Garnets typically occur in metamorphic rocks
Reason (R).: Some varieties of garnets are noticed in igneous rocks
A) Both A and R are true and R explains A
B) Both A and R are true but R does not explain A
C) A is true but R is false
D) A is false but R is true

96. Find the mismatch

A)	Glaucophane	-	Inosilicate
B)	Cancrinite	-	Sorosilicate
C)	Beryl	-	Cyclosilicate
D)	Peridot	-	Nesosilicate

97. Fossils of older age occurring in rocks of younger age are called -:

A)	Guide fossils	B)	Ichnofossils
C)	Leaked fossils	D)	Reworked fossils

98. Match the following:

a.	Dacite	1.	Ultramafic volcanic rock
b.	Lherzolite	2.	Intermediate volcanic rock
c.	Monzonite.	3.	Ultramafic plutonic rock
d.	Komatiite	4.	Intermediate plutonic rock

A)	a-3, b-4, c-2, d-1	B)	a-2, b-3, c-4, d-1
C)	a-3, b-1, c-2, d-4	D)	a-4, b-3, c-1, d-2

99. Find the mismatch:

A)	Quartz	–	Dauphine law
B)	Orthoclase	–	Pericline law
C)	Pyrite	–	Spinel law
D)	Aragonite	–	Cyclical twin

100. The average pH of the sea water is:

A) 7.0 B) 8.2 C) 6.3 D) 5.7

101. Match the following:

a.	Halite	1.	Pleochroic
b.	Tourmaline.	2.	Pleochroic haloes
c.	Staurolite.	3.	Uniaxial
d.	Biotite	4.	Isotropic

A)	a-4, b-1, c-2, d-3	B)	a-1, b-2, c-4, d-3
C)	a-3, b-1, c-2, d-4	D)	a-4, b-3, c-1, d-2

102. Which one of the following silica polymorphs has the highest density?

A) α Quartz B) Stishovite C) β Quartz D) Tridymite

103. Uvarovite belongs to ---------family.

A) Feldspathoid B) Garnet C) Amphibole D) Mica

104. Assertion (A) : Dunites are medium to fine grained
Reason (R).: Dunites are formed from anhydrous magmas

A) Both A and R are true and R explains A
B) Both A and R are true but R does not explain A
C) A is true but R is false
D) A is false but R is true

105. Chari Formation, Patcham Formation and Katrol Formation belong to ------Period
A) Cambrian B) Cretaceous C) Jurassic D) Triassic

106. Suites of igneous rocks are divided into Alkalic, Alkali-Calcic, Calc-Alkalic and Calcic based on -------- Index.
A) Niggli B) Peacock
C) Larsen D) Nockold-Allen

107. **-------** is **not** helpful in determining the top and bottom of beds..
A) Lenticular cross bedding
B) Torrential cross bedding
C) Wedge-shaped cross bedding
D) Tabular cross bedding

108. Match the following:

a.	Zone	1.	Chronostratigraphic unit
b.	Member	2.	Geologic Time unit
c.	System.	3.	Biostratigraphic unit
d.	Epoch	4.	Lithostratigraphic unit

A) a-3, b-4, c-1, d-2 B) a-1, b-2, c-4, d-3
C) a-3, b-1, c-2, d-4 D) a-4, b-3, c-1, d-2

109. ------ were the most abundant shelly fauna on the ocean bottom during the Paleozoic Era.
A) Brachiopods B) Lamellibranches
C) Gastropods D) Cephalopods

110. Choose the attitude of a foliation plane which is **not** possible:
A) $078^0/42^0$ SE B) $328^0/62^0$ NW
C) $310^0/40^0$ NE D) $158^0/60^0$ SW

111. Match the following:

a.	Uranium	1.	Vastan, Gujarat
b.	Lignite	2.	Singrauli, Madhya Pradesh
c.	Bituminous Coal	3.	SurasaniYanam, East Godavari District
d.	Petroleum	4.	Jaduguda, Jharkhand

A) a-1, b-4, c-3, d-2 B) a-3, b-4, c-1, d-2
C) a-4, b-1, c-3, d-2 D) a-4, b-1, c-2, d-3

112. Exogyra, Arca, Ostrea,Trigonia and Venus belong to the Class:
A) Gastropoda B) Cephalopoda
C) Pelecypoda D) Brachiopoda

113. ------ in the Siwalik Group is devoid of fossils.
A) Boulder Conglomerate formation
B) Pinjor formation
C) Dhok Pathan formation
D) Tatrot formation

114. ------does **not** belong to the Spinel Group.
A) Magnetite B) Chromite C) Haematite D) Franklinite

115. The process in which a river picks up sediment, which acts like sandpaper and wears away the rock by abrasion
A) Hydraulic action B) Corrasion
C) Corrosion D) Attrition

116. The process / processes responsible the formation of both outliers and inliers
A) Erosion B) Faulting
C) Folding D) All the above

117. "There are sequential changes in landforms through time (passing through youth, mature and old stages) and these sequential changes are directed towards a well- defined end product-development of peneplain"- Who said this?
A) Penck B) Gilbert C) Davis D) Gilbert

118. Which among the following is **not** a period of mass extinction in the earth's history?
A) 600 million years B) 365 million years
C) 250 million years D) 210 million years

119. The boundary between "low-grade" and "medium grade" metamorphism of Winkler coincides with the -------- facies of Eskola.
A) Greenschist B) Amphibolite
C) Granulite D) Blueschist

120. Sapphirine + quartz, orthopyroxene + sillimanite ± quartz and osumilite, garnet + aluminous orthopyroxene assemblages are typical of --------metamorphism.
A) Granulite facies B) Ultra High Temperature
C) High Grade D) Medium Grade