# A

**20211** **120 MINUTES**

1. The fundamental landform produced by lateral erosion:
   A) Valley flat B) Cut bank C) Delta D) Cuesta

2. Melting wherein a phase melts to a liquid with the same composition as the solid is called:
   A) Fractional melting B) Rayleigh melting
   C) Congruent melting D) Batch melting

3. An igneous rock essentially composed of nepheline and augite:
   A) Hornblendite B) Ijolite C) Pyroxenite D) Spilite

4. An irregular elliptical rim of coral reef around a central lagoon:
   A) Barrier reef B) Fringing reef
   C) Patch reef D) Atoll

5. Conrad discontinuity is commonly seen at a depth of:
   A) 35 km B) 11 km C) 950 km D) 2900 km

6. The variation in the magnetic properties of the subsurface rocks can be expressed in:
   A) Kelvin B) Nanoteslas C) Coloumb D) Joule

7. Long sinuous ridges of sediment deposited by streams that run under or within a glacier is termed as
   A) Eskers B) Moraines C) Fjords D) Horns

8. Rocks, stones or pebbles that have been sculptured, facetted or modified by sand abrasion of wind action and having one or more highly polished flattened sides
   A) Yardangs B) Pediments C) Ventifacts D) Bajadas

9. ------ is a type of reverse fault where the dip of the fault is less than 45 degrees.
   A) Strike-slip fault B) Dip-slip fault
   C) Oblique-slip fault D) Thrust fault

10. Pedial and Pinacoidal are two types of classes forms under -------- crystallographic system.
   A) Triclinic B) Monoclinic
   C) Orthorhombic D) Tetragonal

11. Volcanic equivalent of Syenite is:
   A) Dacite B) Rhyolite C) Trachyte D) Andesite

12. Folds that possess planar limbs and sharp angular hinges are known as:
   A) Parallel folds B) Chevron folds
   C) Concentric folds D) Recumbent folds

13. ---------structure can be expected in the field of elongation of finite strain ellipse.
A) Fold B) Fault C) Boudinage D) No structure

14. --------is a foliation defined by subparallel cleavage domains within which pressure solution has forced the concentration of abundant micas.
A) Gneissosity B) Schistosity
C) Eutaxitic structure D) Crenulation cleavage

15. Wall rocks that are weak and incompetent to respond in a plastic manner to faulting and are commonly converted to ------.
A) Sole marks B) Cockscomb C) Gouge D) Mylonite

16. An unconformity separating strata that are parallel to each other:
A) Disconformity B) Nonconformity
C) Angular unconformity D) None of the above

17. A combination of strike-slip motion and extension (divergent strike-slip) is known as
A) Transpression B) Transform
C) Transtension D) Pull-apart

18. -------- are segments of oceanic crust between island arcs or between island arcs and continents.
A) Oceanic trenches B) Back-arc basins
C) Accretionary prisms D) Continental shelve

19. Stable parts of the continents composed of Precambrian rocks with little or no sediment cover:
A) Aulacogens B) Basin C) Shield D) Fore-arc

20. The process of uplift and erosion is known as ------.
A) Crustal geotherm B) Crustal exhumation
C) Orogeny D) Subduction

21. ---------- are the fragments of the crust, brought to the surface by volcanic eruptions.
A) Crustal xenoliths B) Pegmatites
C) Basalts D) Granites

22. Which has the highest density among the following?
A) Plagioclase B) Biotite C) Quartz D) Perovskite

23. A region of the mantle just above the core where seismic velocity gradients are anomalously low:
A) D-layer B) Lithosphere C) SIAL D) SIMA

24. In Udden-Wentworth grain size scale, the clastic sediment of 4mm to 64 mm is called ----.
A) Granule B) Pebble C) Cobble D) Boulder

25. The boundary between diagenesis and metamorphism is -----.
A) 50 $^0$C B) 300 $^0$C C) 200 $^0$C D) 500 $^0$C

26. ---------- are nearly spherical, polycrystalline carbonate particles of sand size that have a concentric or radial internal structure.
A) Ooliths B) Sparry calcite C) Intraclasts D) Cement

27. The chemical formula $CaSO_4$ $2H_2O$ is applicable to:
A) Anhydrite B) Gypsum C) Kieserite D) Halite

28. The mineral omphacite is associated with which of the following rock?
A) Marble B) Hornfels C) Ecologite D) Dolostone

29. Which one of the following minerals doesn't belong to Blueschist facies?
A) Garnet B) Glaucophane C) Lawsonite D) Chlorite

30. The PT values of the invariant point in the aluminosilicate is:
A) 376 $^0$C , 5.01 kb B) 300 $^0$C, 4 kb
C) 401 $^0$C, 3kb D) 501 $^0$C, 3.76 kb

31. What is 'F' in ACF components defined by Eskola?
A) FeO B) FeO + MgO
C) FeO + MnO D) FeO + MgO + MnO

32. Attainment of $T_{max}$ before $P_{max}$ is typical of
A) Clockwise P-T-t path B) Anticlockwise P-T-t path
C) Cooling path D) Decompression path

33. The average density of the earth is -------.
A) 4.42 g/cm$^3$ B) 5.52 g/cm$^3$ C) 6.52 g/cm$^3$ D) 5.62 g/cm$^3$

34. The spectrum of silica content in intermediate igneous rock is ----------.
A) 66 - 72 wt % B) 45 - 52 wt % C) 52 - 66 wt % D) 35- 42 wt %

35. A granitoid rock with fine sugary texture is called:
A) Diabase B) Granophyre C) Aplite D) Andesite

36. A texture of replacement of plagioclase by epidote is called:
A) Saussuritization B) Biotitization
C) Seritization D) Uralitization

37. The process whereby a solid changes its phase to vapour phase is:
A) Assimilation B) Conduction
C) Convection D) Sublimation

38. Find out a high field strength element (HFS) from the following:
A) K B) Rb C) Cs D) Th

39. Half life of $^{238}U$ $^{206}Pb$ radiogenic isotope is:
A) 0.7038 Gyr B) 245.25 Gyr C) 4.468 Gyr D) 49.44 Gyr

40. The general symbol 111 is of which form?
A) Cube B) Dodecahedron
C) Tetrahexahedron D) Octahedron

41. Any luminous radiations emitted from a substance after the removal of the exciting agent:
A) Phosphorescence B) Fluorescence
C) Opalescence D) Iridescence

42. Find out a biaxial positive mineral from the following:
A) Topaz B) Aragonite C) Hypersthene D) Muscovite

43. The mineral in the Moh's scale that crystallises in cubic system:
A) Corundum B) Quartz C) Topaz D) Fluorite

44. The absolute value of the difference between the extreme refractive indices is termed as:
A) Birefringence B) Pleochrism C) Refraction D) Reflection

45. Hydrothermal ore deposits formed at less than 1500 metre depth and temperature of 50-200 $^{0}$C is termed as:
A) Epithermal B) Mesothermal C) Hypothermal D) Hydrothermal

46. Find the tungsten bearing mineral from the following:
A) Turgite B) Siderite C) Scheelite D) Goethite

47. Find out the sulphide mineral of copper as per the chemical composition CuS:
A) Malachite B) Azurite C) Cuprite D) Covellite

48. Cassiterite is the ore mineral of -------.
A) Zinc B) Silver C) Tin D) Antimony

49. The places Sukinda and Katpal in Odisha are famous for which of the following mineral deposit?
A) Copper B) Chromite C) Zinc D) Gold

50. Specific gravity of baryte is:
A) 3.5 g/cm$^3$ B) 4.5 g/cm$^3$ C) 5.4 g/cm$^3$ D) 6.2 g/cm$^3$

51. Algoma type BIF is associated with ---------type of tectonic setting.
A) Volcanic arc B) Continental platform
C) Glaciogenic D) None of these

52. Magnesite deposit is identified from which of the following district of Kerala:
A) Wayanad B) Nilambur C) Kollam D) Palakkad

53. Index fossils from lower Devonian to upper Cretaceous:
A) Brachiopods B) Gastropods C) Ammonites D) Trilobites

54. The plant fossil Gangamopteris represents:
A) Upper Gondwana B) Lower Gondwana
C) Cretaceous D) Jurassic

55. ------- is a monsoonal index planktonic foraminifera species.
A) Texturalia B) Cibicides
C) Neogloboquadrian D) Globigerina

56. Among the following trilobiltes, which one belongs to Middle Cambrian?
A) Phacops B) Olenus C) Paradoxide D) Olenellus

57. The smallest unit of stratigraphic scale is ----------.
A) Zone B) Stage C) Series D) System

58. ---------- is an area of complete darkness in the ocean with a very low temperature of about 1 $^0$C to 5 $^0$C.
A) Bathyal zone B) Abyssal zone
C) Neritic zone D) Littoral zone

59. The average height of Lesser Himalayan Zone ranges between ------.
A) 1000 m – 2000 m B) 2000 m – 3000 m
C) 3000 m – 4000 m D) 4000 m – 5000 m

60. Which rift is bordered the NE part of Bastar craton?
A) Narmada rift B) Godavari rift
C) Kuchma rift D) Mahanadi rift

61. The quartzite is representing the Cheyair Group of Cuddapah Supergroup:
A) Srisailam Quartzite B) Bairenkonda Quartzite
C) Pulivendla Quartzite D) Gulcheru Quartzite

62. The isotope that can be used to determine the age of groundwater:
A) Uranium 235 B) Thorium 232 C) Potassium 40 D) Carbon 14

63. Match the Litho units in List 1 with their porosity percentage in List 2 and choose the correct answer

| | **List I** | | **List II** |
|---|---|---|---|
| 1. | Silt | a. | 30 |
| 2. | Clay | b. | 28 |
| 3. | Coarse gravel | c. | 42 |
| 4. | Limestone | d. | 46 |

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

64. -------- is resulting from release of water under pressure from confined aquifers either at an outcrop of the aquifer or through an opening in the confining bed.
A) Contact spring B) Artesian spring
C) Impervious Rock Spring D) Fracture spring

65. The frozen portion of the earth's surface water including ocean, lakes, rivers, snow cover, glaciers, ice caps, ice sheets and frozen ground, is termed as:
A) Hydrosphere B) Cryosphere C) Thermosphere D) Exosphere

66. The age of 'Little Ice Age'(a major period of ice advance) is:
A) 0.1 – 0.4 ka BP B) 0.4 – 07 ka BP
C) 0.2 – 0.4 ka BP D) 0.3 – 0.5 ka BP

67. A technique which **CANNOT** be applied in Quaternary dating:
A) Radiocarbon B) Thermoluminescence
C) Rb-Sr D) Tephrochronology

68. One of the following factors that had **NOT** influenced fluvial environments during the Quaternary Period:
A) Base level change and tectonic effects
B) Catchment water balance and erosional processes
C) Metamorphism of the basement rocks
D) Catchment fluvial (river channel) processes

69. Which one of the terms is **NOT** related to the kind of aperture commonly found in pollen grains?
A) Oval B) Triporate C) Tricolpate D) Tricolporate

70. Which one of the following elements is **NOT** a Siderophile?
A) Fe B) Co C) Ni D) Cu

71. Mass of solute (mg) divided by mass of solution (kg) is expressed as
A) Milligrams per litre (mg/L) B) Parts per million (ppm)
C) Molarity D) Molality

72. What happens in a 'closed' thermodynamic system?
A) Mass exchange only
B) Energy exchange only
C) Both mass and energy exchange
D) Neither mass nor energy exchange

73. The first law of thermodynamics is based on which of the following concept?
A) The concept of entropy
B) The concept of entropy scale
C) Principle of conservation of energy
D) Degrees of freedom in the system

74. Elements that occur in rocks or minerals in concentration of a few tenths of a percent (typically < 0.1 wt%):
A) Trace elements B) Major elements
C) Lanthanides D) Actinides

75. Which one among the following is **not** a part of the supersystems of the earth?
A) Asthanosphere B) Geosphere
C) Hydrosphere D) Atmosphere

76. Find out the crustal abundance of elements in decreasing order:
A) O > Na > Si > Ca B) O > Si > Na > Mg
C) O > Al > Si > Ca D) O > Si > Al > Fe

77. ---------- is a pathfinder for Ag-Pb-Zn; Cu-Pb-Zn sulphide deposits.
A) Mo, Te, Au B) Se, V, Mo C) Zn-Cu D) Hg

78. Arrange the following exploration methods in increasing order of cost per square kilometre:
i) Geological mapping ii) Geophysical Surveys
iii) Drilling iv) Remote Sensing
v) Geochemical Surveys (bulk sampling)

A) i – ii – iii – iv – v B) ii – iii – i – v – iv
C) iv – v – iii – ii – i D) iv – i – ii – v – iii

79. The first geophysical technique to be used in oil and gas exploitation:
A) Gravity method B) Self-potential method
C) Magnetic method D) Electromagnetic method

80. Rampura-Agucha mine is located in which state of India?
A) Karnataka B) Gujrat
C) Rajasthan D) Madhyapradesh

81. A method in which current is passed into the ground by metallic electrodes and potential difference is measure by using two N.P. electrodes.
A) Electromagnetic method B) Mise-a-la-Masse method
C) Self-potential method D) Resistivity method

82. In groundwater hydrology, the hydraulic conductivity is expressed in
A) $m^2$/day B) Darcy
C) m / day D) 1 atmosphere/cm

83. The type of drilling method in which air is used as drilling fluid:
A) Rotary Percussion method
B) Rotary method
C) Reverse-circulation rotary method
D) Cable tool method

84. Which one of the following is a major constituent in potable water?
A) Beryllium B) Gallium C) Scandium D) Calcium

85. Which one of the following is the primary application of gamma-gamma logs in subsurface investigation of groundwater?
A) Identification of fluid conductivity
B) Identification of lithology
C) Identification of salinity
D) Identification of moisture content

86. Which one of the following is **NOT** a method for controlling saline water intrusion?
A) Modification of pumping pattern
B) Artificial recharge
C) Subsurface barrier
D) Relocation of wells

87. The rock which allows groundwater to flow by obeying Darcy's law:
A) Granite B) Marble C) Sandstone D) Shale

88. -------- is the reservoir rock for petroleum in Bombay High.
A) Sandstone B) Limestone C) Shale D) Quartzite

89. Electrical conductivity of groundwater is related to ---------.
A) Storativity B) Specific yield
C) Permeability D) Total dissolved solids

90. The absolute age of the great Cenomanian transgression:
A) 98 Ma B) 65 Ma C) 550 Ma D) 240 Ma

91. The state from which Lameta beds carrying fossils of dinosaur eggs is reported:
A) Karnataka B) Kerala
C) Goa D) Madhya Pradesh

92. What is the approximate composite thickness of the Deccan Volcanics?
A) 1000 m B) 2000 m C) 3000 m D) 4000 m

93. Middle Siwalik Group of Himachal Pradesh is characterized by the presence of ------.
A) Mammalian fauna B) Remains of Ramapithecus
C) Reptiles D) None of the above

94. Which one of the following is **NOT** a Group under the Vindhyan Supergroup?
A) Bhander B) Raipur C) Rewa D) Kaimur

95. The mean or average water velocity at any point along a river is defined as -------.
A) The rate of recharge B) The rate of runoff
C) The rate of discharge D) None of the above

96. ---------- are flat backshore areas on beaches, formed by deposition of sediment as waves rush up and expend the last of their energy.
A) Swash zones B) Surf zones C) Breaker zones D) Berms

97. Water with high concentration of sulphuric acid that drains from some mining areas to pollute surface water resources is termed as:
A) Heavy metal pollution B) Hazardous chemical pollution
C) Acid mine drainage D) None of the above

98. The highest concentration of stratospheric ozone occur from approximately ---- km above the surface of the earth.
A) 10-15 km B) 20-25 km C) 30-35 km D) 0-10 km

99. Which one of the following is **NOT** a gaseous pollutant?
A) $SO_2$ B) $H_2S$ C) CO D) $N_2$

100. The type of river that keeps its course by valley deepening during uplift:
A) Antecedent B) Susequent C) Consequent D) Insequent

101. The mode of transport of Clay:
A) Inertia suspension B) Traction
C) Colloidal suspension D) Viscous suspension

102. Which one of the following tides recur at intervals of twelve and half hours?
A) Diurnal tide B) Semi-Diurnal tide
C) Quarter-diurnal tide D) Neap tide

103. Which one of the following is **NOT** a factor for modifying the Ocean currents?
A) Salinity B) Direction and shape of the coast line
C) Seasonal variations D) Bottom topography

104. Which one of the following is an analytical technique through which it identifies the chemical functional group present in the sample and also the types of bonds in it?
A) Petrological Microscope B) Infra-red Spectrometry
C) XRF D) AMS

105. The mineral which possesses the properties such as heat resistance, light weight, elasticity and radiation resistance:
A) Quarz B) Feldspar C) Graphite D) Magnetite

106. A contour line connecting all points of equal depth below the water surface is termed as:
A) Isostasy B) Isobath C) Isochron D) Isohaline

107. The primary unit of lithostratigraphy:
A) Group B) Member C) Formation D) Bed

108. The silicate structure by which Garnet forms:
A) Phyllosilicate B) Orthosilicate
C) Inosilicate D) Cyclosilicate

109. The vertical distance between corresponding lines in the two fracture surfaces of a disrupted stratum is:
A) Throw B) Heave C) Strike D) Apparent dip

110. Older rocks surrounded by younger rocks in normal sequence is called
A) Outlier B) Inlier
C) Nonconformity D) Angular unconformity

111. The wavelength for which the atmosphere is transparent is called -------.
A) Atmospheric Window B) Spatial Resolution
C) Aerotriangulation D) Air-to-Ground correlation

112. The Satellite Based Augmentation System that supports flight navigation over Indian Airspace:
A) GLONASS B) NAVIC C) MSAS D) GAGAN

113. The international space research effort that obtained digital elevation models on a Neo-global scale to generate the most complete high- resolution digital elevation model of the entire Earth.
A) SRTM B) LISS C) Landsat D) SPOT

114. Diffusion of radiation by atmospheric particles is called ------.
A) Absorption B) Adsorption C) Reflection D) Scattering

115. Which among the following is **not** a payload of Mars Orbiter Mission?
A) Lyman-Alpha Photometer B) Thermal Infrared Imaging Spectrometer
C) Mars Colour Camera D) Solar X-ray monitor

116. The Great Red Spot is an area of:
A) Anticyclone in Jupiter B) Cyclone in Jupiter
C) Magmatic hotspot in Jupiter D) South pole of Jupiter

117. -------- are the result of disturbances in the magnetosphere caused by solar wind.
A) Arctic oscillation B) El Niño
C) La Niña D) Aurora

118. Olympus Mons is a -------.
A) Shield Volcano B) Fissure eruption
C) Rift Valley D) Canyon

119. Lonar Lake is an example of:
A) Plunge Pool B) Oxbow Lake
C) Playa Lake D) Impact Crator Lake

120. Selenology is the branch of geology that deals with the study of:
A) Lake B) Canyon C) Moon D) Mars