Combined Technical Services Examination

(NON – INTERVIEW POSTS)

COMPUTER BASED TEST

DATE OF EXAM : 09.09.2026 A.N.

PAPER – II : GEOLOGY (PG DEGREE STD.),

SUB. CODE : 395

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SUB. CODE : 285

1. In Napiers circular parts, how many parts are considered?

(A) 3 (B) 4

(C) 5 (D) 6

(E) Answer not known

2. The maximum grade of symmetry elements are observed in _____.

(A) Hexagonal Division — Normal Class

(B) Isometric System — Normal Class

(C) Orthorhombic System — Normal Class

(D) Monoclinic System — Normal Class

(E) Answer not known

3. Which of the following statements are true about optic axis?

(i) In Isotropic substance double refraction does not occur at all

(ii) Mineral crystallizing in tetragonal and hexagonal system are optically uniaxial

(iii) Minerals crystallizing in monoclinic and triclinic system are optically neutral

(A) (i) only (B) (i) and (iii) only

(C) (i) and (ii) only (D) (ii) and (iii) only

(E) Answer not known

4. Which of the following systems has all closed forms?

(A) Cubic (B) Triclinic

(C) Monoclinic (D) Hexagonal

(E) Answer not known

5. Thickness of the thin section is

(A) 0.3 mm
(B) 0.003 mm
(C) 0.03 mm
(D) 0.0003 mm
(E) Answer not known

6. Manebach and Baveno twins are seen in the optical characteristic of mineral is _____

(A) Sanidine
(B) Orthoclase
(C) Albite
(D) Anorthite
(E) Answer not known

7. Which among the given minerals exhibit IInd order interference colour?

(A) Leucite
(B) Wollastonite
(C) Quartz
(D) Nepheline
(E) Answer not known

8. Which among the following crystals are optically positive?

(A) Calcite
(B) Tourmaline
(C) Apatite
(D) Quartz
(E) Answer not known

9. In stereographic projection, all faces belong to the same zone, must have their mutual intersections parallel to a given direction, are called as _____

(A) Holohedral faces
(B) Tautozonal faces
(C) Hemihedral faces
(D) Anomalous faces
(E) Answer not known

10. Gypsum is the type mineral for which of the given crystal classes?

(A) Hemimorphic class of monoclinic system
(B) Clinohedral class of monoclinic system
(C) Normal class of triclinic system
(D) Normal class of monoclinic system
(E) Answer not known

11. Benitoite is the type mineral for which of the following crystal classes of Hexagonal system?

(A) Trapezohedral class
(B) Hemimorphic class
(C) Trigonal class
(D) Tripyramidal class
(E) Answer not known

12. Normal class of cubic system is called as _____ type.

(A) Galena
(B) Pyrite
(C) Tetrahedrite
(D) Cuprite
(E) Answer not known

13. The low relief gray interference colour and lamellar concentric twins help for identification of mineral is

(A) Nepheline
(B) Analcime
(C) Leucite
(D) Scapolite
(E) Answer not known

14. Nephrite is an amphibole group mineral that crystallizes in

(A) Tetragonal system
(B) Orthorhombic system
(C) Monoclinic system
(D) Triclinic system
(E) Answer not known

15. The development of electrical charges on a crystallized body by pressure or by tension is named as _____

(A) Pyroelectricity
(B) Piezoelectricity
(C) Thermoelectricity
(D) Frictional electricity
(E) Answer not known

16. The length of the unit cell in pyroxene is _____

(A) 4.8 Å
(B) 7.6 Å
(C) 5 Å
(D) 5.3 Å
(E) Answer not known

17. The chemical composition of the cummingtonite is

(A) (Mg, Fe) SiO_3
(B) (Fe, Mg) SiO_3
(C) Mn SiO_3
(D) Ca Mg_3 Si_4 O_{12}
(E) Answer not known

18. The mineral Hyalosiderite is a variety of _____.

(A) Garnet
(B) Olivine
(C) Kyanite
(D) Orthopyroxene
(E) Answer not known

19. The chemical composition of pyrope in Garnet Group _____

(A) $Mg_3 Al_2 Si_3 O_{12}$
(B) $Fe_3 Al_2 Si_3 O_{12}$
(C) $Mn_3 Al_2 Si_3 O_{12}$
(D) $Ca_3 Al_2 Si_3 O_{12}$
(E) Answer not known

20. Choose the right matches among type.

1. Alkali felspar — Andesine
2. Plagioclase feldspar — Labradorite
3. Bytownite — $An_{70} - An_{90}$
4. Anorthite — Alkali felspar

(A) 1 and 3 are correct
(B) 1 and 2 are correct
(C) 2 and 3 are correct
(D) 3 and 4 are correct
(E) Answer not known

21. The magnesium mica usually containing fluorine and free from iron is _____

(A) Muscovite
(B) Lepidomelane
(C) Phlogopite
(D) Zinnwaldite
(E) Answer not known

22. The chemical composition of Anorthoclase is

(A) (K, Na) Al Si_3 O_8
(B) (Na, K) Al Si_3 O_8
(C) K Al Si_3 O_8
(D) Na Al Si_3 O_8
(E) Answer not known

23. Which of the following statements are true about quartz?

(i) Rock crystal is the purest, transparent variety of quartz.
(ii) Quartz has two sets of cleavage.
(iii) Chemical composition of quartz is SiO_6

(A) (i) only
(B) (i) and (iii) only
(C) (i) and (ii) only
(D) (ii) and (iii) only
(E) Answer not known

24. In most of the Amphibole group minerals the optic plane is

(A) {100}
(B) {010}
(C) {001}
(D) {110}
(E) Answer not known

25. Find out the pyroxene group mineral that is used for ornamental purposes and as gemstones.

(A) Augite
(B) Jadeite
(C) Diopside
(D) Wollastonite
(E) Answer not known

26. An inclusion that has obviously been derived from some older formation genetically unrelated to the igneous rock itself is called as

(A) Phacolith
(B) Xenolith
(C) Lopolith
(D) Batholith
(E) Answer not known

27. Substances that undergo a large plastic deformation before rupture are called

(A) Malleable
(B) Brittle
(C) Amorphous
(D) Ductile
(E) Answer not known

28. A _____ fold is one in which the axial plane is essentially horizontal with the limit of variation of axial planar dip, and the resulting limit of plunge, being 10°.

(A) isoclinal
(B) box
(C) fan
(D) recumbent
(E) Answer not known

29. The younger beds of the down throw side come into contact with older beds of the up throw side. Fault plane inclined towards younger bed is called _____.

(A) Normal fault
(B) Reverse fault
(C) Lateral fault
(D) Strike slip fault
(E) Answer not known

30. Joints parallel to the axial planes of folds are _____.

(A) Horizontal joints
(B) Conjugate joints
(C) Release joints
(D) Extension joints
(E) Answer not known

31. The landward edges of successive older beds are exposed while seaward portions are offset. This is called _____.

(A) Offlap
(B) Onlap
(C) Overlap
(D) Unconformity
(E) Answer not known

32. The Limestone bed consist of 3 sets of mutually perpendicular joints of which one set parallel or coincide with the bedding plane, the other two across the bed are called _____.

(A) Prismatic joints
(B) Mural joints
(C) Sheet joints
(D) Master joints
(E) Answer not known

33. In a _____, a lineation is prominent and in some instances S-planes may be absent.

(A) B-Tectonite
(B) S-Tectonite
(C) Translation gliding
(D) Twin gliding
(E) Answer not known

34. The property of rocks whereby they break along approximately parallel surfaces is termed _____.

(A) Rock cleavage
(B) Lineation
(C) Foliation
(D) Bedding fissility
(E) Answer not known

35. The "Stretched pebbles" in a deformed conglomerate may lie with the long axes _____ to one another, thus giving a distinctive fabric.

(A) Parallel
(B) Perpendicular
(C) Not parallel
(D) Equal
(E) Answer not known

36. Pick out the odd one from the following.

(A) Ptillophyllum
(B) Williamsonia
(C) Otozamites
(D) Sigillaria
(E) Answer not known

37. To stain the samples the washed residue on a 240 mesh screen is placed in a bowl of 1g/L solution of rose Bengal stain which is allowed to stain for

(A) 20 minutes
(B) 60 minutes
(C) 90 minutes
(D) 120 minutes
(E) Answer not known

38. The glossopteris flora extinct during

(A) Permo-Triassic
(B) Jurassic
(C) Cretaceous
(D) Permain
(E) Answer not known

39. Match the followings :

(a)	Java man	1.	Sinanthropus pekinensis
(b)	Peking man	2.	Pithecanthropus
(c)	Pilt down man	3.	Homo sapiens fossil
(d)	Cro-Magnon man	4.	Eoanthropus Dawsoni

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

(E) Answer not known

40. Match the following.

(a)	Gorgosaurus	1.	10 meters long
(b)	Gigantosaurus	2.	35 meters long
(c)	Brontosaurus	3.	22 meters long
(d)	Diplodocus	4.	29 meters long

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

(E) Answer not known

41. In foraminifera, the first formed chamber in multilocular form is known as

(A) Monothalamus
(B) Polythalamus
(C) Proloculum
(D) Umbilicus
(E) Answer not known

42. The cresent type of eyes are present in the fossils of _____

(A) Calymene
(B) Olenellus
(C) Paradoxides
(D) Phacops
(E) Answer not known

43. The period of rise of cephalopods and age of graptolites is :

(A) Cambrian
(B) Ordovician
(C) Silurian
(D) Devonian
(E) Answer not known

44. The posterio-lateral corner of the cephalon is

(A) Genal angle
(B) Glabella
(C) Thorax
(D) Pygidium
(E) Answer not known

45. The terminal end of corallite is the epical end and the triangular depressed and open end is called

(A) Theca
(B) Epitheca
(C) Calyx
(D) Septa
(E) Answer not known

46. A foraminiferal shell composed of number of chambers which are circular in transverse section, arranged in a straight line and aperture at the last chamber is called as?

(A) Lagena
(B) Cristellaria
(C) Textularia
(D) Nodosaria
(E) Answer not known

47. Devonian ammonoids that belong to the family clymenidae have the siphuncle located at

(A) Dorsal margin
(B) Ventral margin
(C) Anterior margin
(D) Posterior margin
(E) Answer not known

48. Larger number of plants, graptolites, arthropods and fishes have been preserved in shales, clay and coal by the following method.

(A) Impressions of compressions (B) Mineralization
(C) Calcification (D) Histometabasis
(E) Answer not known

49. In Graptolites, the theca were attached to a rock by a rod like branch known as _____

(A) Aperture (B) Stipe
(C) Stolotheca (D) Hook
(E) Answer not known

50. The tube at the proximal end, a small conical cup like structure belonging to initial zooid of colony is known as

(A) Suture (B) Theca
(C) Sicula (D) Cortex
(E) Answer not known

51. The geological age of monograptus is

(A) Ordovician (B) Cambrian
(C) Devonian (D) Silurian
(E) Answer not known

52. In trilobites, the cheeks are divided by

(A) Facial suture (B) Dorsal furrow
(C) Palpebral furrow (D) Metastome
(E) Answer not known

53. In trilobites, the plate on underside of Cephalon in front of mouth is called as _____.

(A) Hypostome
(B) Metastome
(C) Ocular ridge
(D) Glabella
(E) Answer not known

54. All Ammonoids of the following age have goniatite suture

(A) Devonian
(B) Triassic
(C) Jurassic
(D) Permain
(E) Answer not known

55. The posterior angle of the cheeks in calymene is referred as

(A) Genal angle
(B) Genal spine
(C) Free cheek
(D) Fixed cheek
(E) Answer not known

56. The lower siwalik succession of north west India of thickness is

(A) 5000 ft
(B) 8000 ft
(C) 1000 ft
(D) 2000 ft
(E) Answer not known

57. Match the chronological age of Pleistocene glaciations :

			Years ago
(a)	I-Glacial-Tatrot	1.	1,50,000
(b)	IV-interglacial	2.	30,000
(c)	V-Glacial	3.	80,000
(d)	IV-Glacial Terrace-loam	4.	1,00,000

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

(E) Answer not known

58. Choose the correct sentence

1. Interglacial period resulted in large quantities of melt water from glacier and increased the levels of oceans and added water to river system.
2. Glaciations resulted into large glacial sedimentary deposits and glacial boulders.
3. Ice age resulted in E1 rapid change in the global environment and had on impact on huge mammals.

(A) 1 and 2 only
(B) 2 and 3 only
(C) 1, 2 and 3 only
(D) 3 and 1 only
(E) Answer not known

59. The Eocene is well developed in Assam. The Southern and Eastern parts of Shillong plateau is represented by the

(A) Disang series
(B) Laki series
(C) Jaintia series
(D) Kopili series
(E) Answer not known

60. Siwalik basin is a kind of _____ basin.

(A) Intra continental
(B) Back arc
(C) Fore deep
(D) Aulacogen
(E) Answer not known

61. Glossopteries is a plant fossils known from the rocks of

(A) Lower Gondwana
(B) Upper Gondwana
(C) Middle Gondwana
(D) Inter trappen beds
(E) Answer not known

62. Name the most reliable aid for dating of the Permian-Triassic boundary in the Gondwana sequence of India.

(A) Spores and pollen
(B) Lystosaurus
(C) Proterosuchus
(D) Modiola
(E) Answer not known

63. Which of the following groups accommodate Panna shales?

(A) Semri
(B) Rewa
(C) Kaimur
(D) Bhander
(E) Answer not known

64. Ptillophyllum flora is characteristic of which of the following sub-groups?

(A) Lower Gondwana
(B) Middle Gondwana
(C) Upper Gondwana
(D) Upper Vindhyan
(E) Answer not known

65. Bairakonda formation comprises which of the following rock types?

(A) Marble
(B) Limestones
(C) Quartzites
(D) Dolomites
(E) Answer not known

66. Large trunks of fossil wood are found in

(A) Trichinopoly Group
(B) Uttatur Group
(C) Ariyalur Group
(D) Niniyur Group
(E) Answer not known

67. The rocks forming Gondwana group are of fluviatile or lacustrine nature, later sank along trough-faults amidst the ancient rocks, preserved gondwana strata with their rich.

(A) Limestone
(B) Coal seams in India
(C) Lead & zinc deposits in India
(D) Platinum group of minerals in India
(E) Answer not known

68. The Bailadila group is equivalent to

(A) Middle Dharwar
(B) Lower Dharwar
(C) Upper Dharwar
(D) Delhi Super group
(E) Answer not known

69. The Delhi super group, the lower part of the succession consist of predominantly _____.

(A) Argillaceous
(B) Calcareous slate
(C) Arenaceous facies
(D) Schist
(E) Answer not known

70. The Dharwarian rocks of the Aravalli region form a long and wide _____ in the schistose gneisses of Rajasthan.

(A) Anticline
(B) Syncline
(C) Anticlinorium
(D) Synclinorium
(E) Answer not known

71. The most characteristic fossil of inter-trappean beds is _____.

(A) Cypris
(B) Physa
(C) Pycnodus
(D) Indosuchus
(E) Answer not known

72. The Vindhyan and Kurnool basins of the Late Proterozoic age were separate from each other by the _____.

(A) Chandrapur sandstone
(B) Ranipur formation
(C) Satpura Orogen
(D) Kalifar formation
(E) Answer not known

73. Arrange the following chrono stratigraphic units in the order of wider to smaller

(A) Zone, Stage, Series, System, Erathem
(B) Zone, Series, Stage, Erathem, System
(C) Erathem, System, Series, Stage, Zone
(D) Erathem, Series, System, Stage, Zone
(E) Answer not known

74. The geological age of Gauran beds is

(A) Early Cambrian
(B) Cambro-Ordovician
(C) Late Ordovician
(D) Early Silurian
(E) Answer not known

75. The oldest rocks exposed at the base of the southern cliffs are known as

(A) Trichinopally Beds
(B) Saline Series
(C) Nallamalai Series
(D) Tethys Himalays
(E) Answer not known

76. Which of the following statements are True according to Valentin's classification?

(i) Coasts that have advanced are called as Emergent coast.
(ii) Coasts that have retreated are called as submergent coasts.
(iii) Emergent coasts have Erosional Topography.

(A) (i) only
(B) (i) and (iii) only
(C) (i) and (ii) only
(D) (ii) and (iii) only
(E) Answer not known

77. River flows on a number of channels separated by lenticular sand and gravel bars which may again meet the main channel in the down stream are called _____.

(A) Natural Levees
(B) Delta
(C) Alluvial fan
(D) Braided River
(E) Answer not known

78. A simple genetic classification of the coast which places heavy emphasis on sea level change, was proposed by

(A) Shepard
(B) Johnson
(C) Davies
(D) Bird
(E) Answer not known

79. Geosynclines classified on the basis of geographical location relative to the continent and nature, is proposed by

(A) James Hall
(B) Schuchert
(C) Stille
(D) Airy
(E) Answer not known

80. The Rhyolitic magma is formed by partial melting of

(A) Upper mantle
(B) Continental crust
(C) Oceanic crust
(D) Lower mantle
(E) Answer not known

81. Choose the right matches.

Degree of intensity and observations – A scale is devised by Mercalli (and later modified by wood and Neumann).

	Degree of Intensity		Observation
1.	Ruinous	–	Felt by people at rest like tremors by a lorry
2.	Disastrous	–	Chimneys fall, poorly built buildings damaged
3.	Very disastrous	–	Landslides, bridges, broken few buildings remain standing
4.	Catastrophic	–	Total destruction, objects thrown into air, ground rises and falls in waves

(A) 1 and 3 are correct
(B) 1 and 2 are correct
(C) 2 and 3 are correct
(D) 3 and 4 are correct
(E) Answer not known

82. Which of the following statement(s) is/are true?

(i) A seismogram is a combination of a seismometer and seismograph plotter.

(ii) The seismometer detects the sesmic waves to produce a seismogram.

(iii) Seismograph is the record of an earthquake in the form of a trace marking the passage of seismic waves.

(A) (i) only
(B) (ii) only
(C) (i) and (ii) only
(D) (ii) and (iii) only
(E) Answer not known

83. The hypothesis of 'Sea-floor spreading' was formulated first in 1960 by

(A) Wegener-Taylor
(B) Heiskanen
(C) Van-Weizsacker
(D) Harry Hess
(E) Answer not known

84. 'Salfataras', 'Mofettes' and 'Saffoni' are the gases emitted by,

(A) Fumeroles
(B) Hot springs
(C) Geysers
(D) Mud volcanoes
(E) Answer not known

85. Residual blocks of well Jointed granitic rocks rising above the ground level as a results of mechanical and chemical weathering are called _____.

(A) Karren
(B) Tors
(C) Etch plains
(D) Regolith
(E) Answer not known

86. The hard rocks are eroded at very slow rate whereas the soft ores are eroded rapid rate than the name of this structure is _____.

(A) Hogbag
(B) Bajada
(C) Homoclinal
(D) In Selberg
(E) Answer not known

87. Pedeplains are formed due to the

(A) Erosional landforms by stream
(B) Glacial erosion in mountain regions
(C) Deposition of material transported by wind, water and ice
(D) Ground water activity
(E) Answer not known

88. Which one is not included in the reconstruction of Gondwanaland?

(A) Africa
(B) Australia
(C) Madagascar
(D) Greenland
(E) Answer not known

89. Find out the correct answer :

Large scale explosion within the nebula has given rise to the planets and the sun.

(A) Planetesimal hypothesis
(B) Tital hypothesis
(C) Big-Bang theory
(D) Weizsacker's hypothesis
(E) Answer not known

90. Half-life is a term used for :

(A) The time taken by a radioactive element to change an end product equivalent to half of the total volume
(B) The time taken for one-half quantity of radioactive element to decay to a stable end product
(C) The period for which a planet can exist in the solar system
(D) (A) & (C) are correct
(E) Answer not known

91. The source material for the mantle Plumes that gives rise to hot spots is _____.

(A) Low velocity layer
(B) D" layer
(C) Inner core - Outer core boundary
(D) 670 km discountinuity
(E) Answer not known

92. The continental drifting began about:

(A) 300×10^6 years ago
(B) 250×10^6 years ago
(C) 200×10^6 years ago
(D) 150×10^6 years ago
(E) Answer not known

93. Who has proposed isostasy theory based on Uniform density with varying thickness?

(A) Airy
(B) Pratt
(C) Joly
(D) Hayford and Bowie
(E) Answer not known

94. A long but narrow depression of the sea floor having relatively steep sides are called as

(A) Ridge
(B) Trench
(C) Trough
(D) Rise
(E) Answer not known

95. Which is the best example for Isostatic adjustments?

(A) Australia
(B) India
(C) China
(D) Greenland
(E) Answer not known

96. The one which will ultimately be fed into the beneficiation plant is

(A) Cut of grade
(B) Average grade
(C) Good grade
(D) Mill grade
(E) Answer not known

97. Consider the statement regarding sampling

I. 'Sample' and 'specimen' are consider to be synonymous

II. According to mining Geologists, 'Specimen' refers to material collected.

(A) Both I and II are true
(B) I is true II is false
(C) I is false II is true
(D) Both I and II are false
(E) Answer not known

98. Pong dam is an example of _____.

(A) Arch dam
(B) Detention dam
(C) Earth dam
(D) Storage dam
(E) Answer not known

99. Which one of the following is included among the critical and strategic minerals list in the mines and minerals (Development and Regulation) Amendment Act, 2023?

(A) Ordinary sand

(B) Lithium bearing minerals

(C) Brick Earth

(D) Clay soil

(E) Answer not known

100. Match the following with Dams and its structure.

Dam		Structure
(a)	Idukki	1. Masonry structure
(b)	Mettur	2. Masonry cum earth dam
(c)	Krishnarajsagar	3. Concrete arch dam
(d)	Manimuthar	4. Gravity type masonry dam

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

(E) Answer not known

101. Assessment of geological hazards can be done through

(A) Hazard mapping

(B) Structural mapping

(C) Landform mapping

(D) Topographical mapping

(E) Answer not known

102. Sea waves generated by earthquakes are known as

(A) Primary waves
(B) Secondary waves
(C) Surface waves
(D) Tsunami
(E) Answer not known

103. Texture is an image is mainly due to

(A) Repetitions of tone
(B) Repetitions of size
(C) Repetitions of shape
(D) Repetitions of scale
(E) Answer not known

104. The Raster graphic in GIS represents data, in _____ grid of pixels.

(A) Circular
(B) Rectangular
(C) Square
(D) Triangle
(E) Answer not known

105. Spectral reflectance ($\rho\lambda$) is mathematically expressed as

(A) $\rho_\lambda = \frac{E_R(\lambda)}{E_A(\lambda)}$
(B) $\rho_\lambda = \frac{E_I(\lambda)}{E_R(\lambda)}$
(C) $\rho_\lambda = E_I(\lambda) \times E_R(\lambda)$
(D) $\rho_\lambda = \frac{E_R(\lambda)}{E_I(\lambda)} \times 100$
(E) Answer not known

106. The check dam construction build on small tributary streams to regulate the flow of _____.

(A) River
(B) Dam
(C) Tunnel
(D) Road construction
(E) Answer not known

107. Remote sensing involves the measurements of different radiations of

(A) Magnetic spectrum
(B) Light
(C) Electromagnetic spectrum
(D) Reflected Radiations
(E) Answer not known

108. The major arch dam in India is

(A) Nagarjuna Sagar Dam
(B) Bhakra Dam
(C) Idduki Dam
(D) Hirakud Dam
(E) Answer not known

109. The silicate material of the mantle has

(A) Hornfels
(B) Quartile
(C) Schist
(D) Peridiotitic composition
(E) Answer not known

110. Which of the following points are need to be consider for minimize the siltation within the reservoir?

(i) Constructing series of small check dam in the upstream direction of the river

(ii) Removing all the vegetation / vegetal cover in the upstream direction

(iii) Removing of already deposited sediments from the reservoir

(A) (i) only
(B) (i) and (ii) only
(C) (i) and (iii) only
(D) (ii) and (iii) only
(E) Answer not known

111. Assertion [A] : Tunnel alignment in folded strata is complex in nature. It depends on the type of folding through which the tunnel passes.

Reason [R] : Inclined beds create more problems during construction of the tunnel, depending on the altitude of the beds.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A] is correct

(E) Answer not known

112. Arranging chronological order.

Minerals precipitate out of evaporating sea water in the reverse order of their solubilities, so that the order of precipitation is

(1) Halite (i.e. common table salt, Nacl)

(2) Gypsum ($CaSO_4 . 2H_2O$) and anhydrite

(3) Potassium and magnesium salts.

(4) Limestone ($CaCO_3$) and dolomite [$CaMg(CO_3)_2$]

(A) (2), (4), (3), (1)

(B) (3), (4), (2), (1)

(C) (4), (2), (1), (3)

(D) (2), (3), (4), (1)

(E) Answer not known

113. Consider the following statements regarding geochemical anomaly :

I. Assessing relative values of various elements present is 'background value'.

II. The 'background' value is the amount of a particular element present in the parent rock.

III. Back ground values helps in locating and assessing the anomaly.

(A) All are correct
(B) I and III are correct II is incorrect
(C) Only I is correct
(D) All are Incorrect
(E) Answer not known

114. Uniaxial compressive strength range of Dolerites are

(A) 1000 – 2500 (Kg/cm^2)
(B) 1500 – 3500 (Kg/cm^2)
(C) 50 – 150 (Kg/cm^2)
(D) 500 – 2500 (Kg/cm^2)
(E) Answer not known

115. Phosphors trigger off the action and the scintillation produced is made to fall on an electronic light amplification tube is known as

(A) Flash light
(B) Photo amplifier
(C) Quenching agent
(D) Ionisation
(E) Answer not known

116. Pick out common groundwater tracer from the following

(A) Nitrate
(B) Carbon dioxide
(C) Chloride
(D) Fluoride
(E) Answer not known

117. In 3 layer case of resistivity the "k" type curve will have a shape of _____.

(A) Inverted parabola
(B) Parabola
(C) Ascending curve
(D) Descending curve
(E) Answer not known

118. The advantages of drip irrigation are :

(a) Increase in yield ranging from 20% – 30%.
(b) Does not offer frost protection as sprinkless do.
(c) Salts accumulated at the outer edge of the wetted pattern.
(d) Requires regular flushing and supervision.

(A) (d) only
(B) (a), (b), (c) and (d)
(C) (a) and (c) only
(D) (b) and (d) only
(E) Answer not known

119. This pump is ideally suitable for low head high discharge pumping from rivers, canals and large tanks.

(A) Propeller pump
(B) Airlift pump
(C) Jet pump
(D) Turbine pump
(E) Answer not known

120. If water is passed into a recharge well then

(A) Cone of depression is formed
(B) Cone of recharge is formed
(C) Flat steady state is formed
(D) Initially steady state after cone of depression
(E) Answer not known

121. Match the following :

	Drilling method		Diameter of the hole(cm)
(a)	Reverse circulation	1.	15 – 45 cm
(b)	Jetting	2.	20 – 45 cm
(c)	Cable tool percussion	3.	45 – 60 cm
(d)	Rotary drilling	4.	Upto 15 cm

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

(E) Answer not known

122. Which one of the methods is not used for drilling in unconsolidated strata?

(A) Cable tool method
(B) Rotary method
(C) Air rotary method
(D) Rotary percussion method
(E) Answer not known

123. _____ is the component of the bottom of the casing of a borewell that protects the casing when cable tool drilling is done.

(A) Drive head
(B) Bailer
(C) Drilling bit
(D) Drive shoe
(E) Answer not known

124. Theoretically porosity is expressed by the relationship of

(A) $\text{Porosity} = \dfrac{\text{Total volume of rock}}{\text{Volume of intersices}}$

(B) $\text{Porosity} = \dfrac{\text{Volume of Intersices}}{\text{Total volume of rock}} \times 100$

(C) $\text{Porosity} = \dfrac{\text{Total volume of soil}}{\text{Total volume of rock}} \times 100$

(D) $\text{Porosity} = \dfrac{\text{Total volume of intersices}}{\text{Total volume of soil}} \times 100$

(E) Answer not known

125. Portion of Rainfall which appears on the surface / stream is called the _____.

(A) Infiltration
(B) Percolation
(C) Runoff
(D) Evapotranspiration
(E) Answer not known

126. Which of the following is correctly matched :

I.	Extremely permeable	–	Clay, Marls, Compact Igneous rocks
II.	Semi-permeable	–	Fine grained sands, loams slightly joined crystalline rocks
III.	Impermeable	–	Coarse sand stone, limestone
IV.	Specific retention	–	Minimum porosity of Aquifer

(A) I and II
(B) II and III
(C) IV and I
(D) II only
(E) Answer not known

127. The Hydraulic conductivity is determined by

(A) Planimeter
(B) Permeameter
(C) Pan measurement
(D) Barometer
(E) Answer not known

128. Assertion [A] : In aquifers compossed of unconsolidated materials the resistivity decreases with the degree of saturation and salinity of ground water.

Reason [R] : In relative porous formation the resistivity is controlled move by water content and quality with in the formation then by the rock resistivity.

(A) [A] is true [R] is false
(B) Both [A] and [R] are false
(C) Both [A] and [R] are true [R] is the correct explanation of [A]
(D) Both [A] and [R] are true [R] is not the correct explanation of [A]
(E) Answer not known

129. Which one is the largest and most potential groundwater, reservoir provinces in India?

(A) Indogangetic – Brahmaputra
(B) Crystalline provinces
(C) Gondwana sedimentary provinces
(D) Deccan trap provinces
(E) Answer not known

130. Which is the highest porosity given in the following?

(A) Sandstone fire grained
(B) Sandstone medium grained
(C) Limestone
(D) Dolomite
(E) Answer not known

131. Based on high to low rank the Coking Coal varity is

(A) High volatile bituminous
(B) Low volatile bituminous
(C) Medium volatile bituminous
(D) Very low volatile bituminous
(E) Answer not known

132. The ore of copper is chalcopyrite with copper percentage around _____.

(A) 34.5%
(B) 63.3%
(C) 79.8%
(D) 88.8%
(E) Answer not known

133. In India, oil was struck for the first time in limestone at

(A) Rewa
(B) Bombay high
(C) Ankleshwar
(D) Kaikalur
(E) Answer not known

134. Identify the incorrect statement from the below

(a) The Khetri copper deposits of Tamilnadu is one of the important copper deposit in the country

(b) The singhbhum copper belt of Karnataka is very important copper deposits

(c) Shevaroy hills bauxite of Salem in Tamilnadu

(d) Lead-zinc deposits of Rajasthan

(A) (a) and (b) incorrect
(B) (b) and (c) incorrect
(C) (b) and (d) incorrect
(D) (c) and (a) incorrect
(E) Answer not known

135. The percentage of carbon in crude oil as per ZoBell's findings is

(A) 73
(B) 85
(C) 58
(D) 52
(E) Answer not known

136. 'Cate' suggested the term _____ for the downward movement of organic matter, metals and clay through the weathering profile of soils that may involve catalytic reactions and transform some of the organic matter into bituminous substances including petroleum and coal.

(A) Decarboxylation
(B) Nitrification
(C) Podzolization
(D) Ammonification
(E) Answer not known

137. The age of Assam state oil fields

(A) Oligocene to Lower Miocene
(B) Permian – Triassic
(C) Mio – Pliocene
(D) Triassic – Jurassic
(E) Answer not known

138. The variety of coal that are bright, glassy looking, jet like coal band with concoidal fracture is called _____.

(A) Durain
(B) Fusain
(C) Vitrain
(D) Clarain
(E) Answer not known

139. The Tipam Sandstones of mio-pliocene age are the host rocks where _____ oil field is situated.

(A) Ankleshwar
(B) Digboi
(C) Kalol
(D) Nawagam
(E) Answer not known

140. How much percentage of carbon is in Anthracite?

(A) 70 – 80% carbon
(B) 60 – 75% carbon
(C) 50 – 60% carbon
(D) 92 – 97% carbon
(E) Answer not known

141. The coal formed in _____ rocks.

(A) Igneous rocks
(B) Sedimentary rocks
(C) Metamorphic rocks
(D) Meta – Sedimentary rocks
(E) Answer not known

142. 'PLUMBAG' is the other name for the mineral _____.

(A) Lead
(B) Zinc
(C) Graphite
(D) Manganese
(E) Answer not known

143. The process of serpentinisation plays an important part in the formation of

(A) Chrysotile asbestos
(B) Magnesite
(C) Chromite
(D) Tremolite
(E) Answer not known

144. Find the end product of radioactive decay of thorium.

(A) $^{232}Th \rightarrow {}^{204}Pb + 4^{4}He$
(B) $^{232}Th \rightarrow {}^{206}Pb + 8^{4}He$
(C) $^{232}Th \rightarrow {}^{208}Pb + 6^{4}He$
(D) $^{232}Th \rightarrow {}^{207}Pb + 7^{4}He$
(E) Answer not known

145. The process of copper ore formation in Khetri copper belt is _____.

(A) Metasomatic replacement
(B) Magmatic concentration
(C) Cavity filling
(D) Oxidation and supergene enrichment
(E) Answer not known

146. Match the following :

(a)	China Clays	1.	Semi Refractory
(b)	Ball Clays	2.	Fire Brick
(c)	Fire Clays	3.	Good quality plastic
(d)	Stoneware Clays	4.	Whitest, most expensive

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

(E) Answer not known

147. Diamond can be transformed to Graphite when it is heated to about _____.

(A) 1450 °C
(B) 1550 °C
(C) 1650 °C
(D) 1850 °C
(E) Answer not known

148. _____ and _____ are induced cavities of Hydrothermal ore forming processes.

(A) Saddle reefs and Tectonic breccia
(B) Pore spaces and cooling crackes
(C) Crystal lattices and bedding planes
(D) Vesicles and blow holes
(E) Answer not known

149. _____ classification divided the ore deposits into regular and irregular.

(A) Agricola's
(B) Lindgren's
(C) Bateman's
(D) Voncotta's
(E) Answer not known

150. Minerals that lose volatile constituents at certain temperatures, the process is called

(A) Melting point
(B) Dissociation
(C) Exsolution
(D) Inversion points
(E) Answer not known

151. Which one of the following is a very minor process in the formation of mineral deposits?

(A) Contact metasomatism
(B) Magmatic concentration
(C) Hydrothermal – cavity filling
(D) Sublimation
(E) Answer not known

152. Corundum in Nepheline syenite in ontario is an example of _____ process.

(A) Dissemination
(B) Segregation
(C) Injection
(D) Residual liquid segregation
(E) Answer not known

153. Gas rich inclusions generally contain more than 60% vapor and dominantly aqueous but CO_2 may be present in small amount are

(A) Type I fluid inclusion
(B) Type II fluid inclusion
(C) Type III fluid inclusion
(D) Type IV fluid inclusion
(E) Answer not known

154. The mutual relationships and time sequence of mineral formation is known as ————.

(A) Paragenesis
(B) Ore genesis
(C) Ore localisation
(D) Mineral zoning
(E) Answer not known

155. The hutti gold is ———— deposits.

(A) Ladder veins
(B) Solution cavity filling
(C) Saddle reef
(D) Pore space filling
(E) Answer not known

156. A sheet-like accumulation of biogenic deposits single or complex type of organism involved in their formation is called

(A) Biohermal limestone
(B) Biostromal limestone
(C) Pedagic limestone
(D) Calcic-Sinter
(E) Answer not known

157. Sediment accumulate with in the basins by the process of vertical filling as in the flood basin of a river is called

(A) Progradation
(B) Aggradation
(C) Lateral accretion
(D) Fining upward
(E) Answer not known

158. Match the following of the Ocean floor zones according to depth :

(a)	Neritic	1.	above 6000 m
(b)	Bathyal	2.	below 2000 m
(c)	Abyssal	3.	200 m and above
(d)	Hadal	4.	200–2000 m

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

(E) Answer not known

159. A typical geosyncline consists of an amagmatic zone of relatively shallow-water sedimentation bordering the craton which receives sediments mainly from the cratic source is termed as:

(A) Miogeosyncline
(B) Eugeosyncline
(C) Geanticline
(D) Exogeosynclines
(E) Answer not known

160. The clay rock contains a good proportion of carbonates of lime and magnesia is ————————.

(A) Tillite
(B) Keolin
(C) Potter clay
(D) Marl
(E) Answer not known

161. The sedimentary rocks similar to reefoidal carbonate and represents a loose network of carbonate with large voids. The framework is constituted by organisms such as corals, algae and bryozoa is _____.

(A) Wacke stone
(B) Mudstone
(C) Bound stone
(D) Pack stone
(E) Answer not known

162. Choose the correct sentence.

(a) Precambrian banded Iron formations continue to be enigmatic rocks. Illustrating that the present is a far from perfect key to the past

(b) The dominance of hematite among the Iron bearing minerals means that some free oxygen must have been present to oxidize the ferrous Iron released from igneous and metamorphic source rock

(c) Banded Iron ores are enigmatic rock typically composed mostly of chert but contain atleast 15% Iron in the form of hematite, magnetite, siderite and other minerals

(A) (a), (b), (c) are correct
(B) (a) and (b) only correct
(C) (b) and (c) only correct
(D) (a) and (c) only correct
(E) Answer not known

163. Choose the correct answer.

A. Apart from pebble size and roundness several other scalar properties like gradual variation in bed thickness, cross bedding scale give clues to paleocurrent direction.

B. Paleocurrent maps utilizing the scalar elements, that can be prepared from unoriented core samples, but oriented core sample are essential when directional properties are involved.

(A) A and B are correct
(B) A only correct
(C) B only correct
(D) A and B are wrong
(E) Answer not known

164. The Palaeocurrents converge on the centre of the basin is referred to as ———— in Palaeocurrent analysis.

(A) Shoreline environment
(B) Syndepositional
(C) Post depositional
(D) Modern deposit
(E) Answer not known

165. The size of the Boulder in sedimentary rocks ————.

(A) more than 256 mm
(B) 64-256 mm
(C) less than 64 mm
(D) less than 256 mm
(E) Answer not known

166. Folk and ward 1957 grain size measure the equation of $\frac{(\phi 95 - \phi 5)}{244(\phi_{75} - \phi_{25})}$ used for the parameter.

(A) Graphic mean
(B) Inclusive Graphic standard deviation
(C) Graphic kurtosis
(D) Inclusive Graphic skewness
(E) Answer not known

167. Give the name of crypto crystalline form of chemically formed rock composition in the following list of rocks

(A) Flint
(B) Radiolarian
(C) Kankar
(D) Chalk
(E) Answer not known

168. Oolitic structure is explained as the

(A) preserve of gravel -size fractions
(B) preserve of fish egged size concretion in rocks
(C) preserve of walnut size concretion in rocks
(D) preserve of boulder size fragments
(E) Answer not known

169. Which one of the following includes tracks, trails, grazing patterns, borrows and other disruptive structures?

(A) Biostratification structures
(B) Bioturbation structures
(C) Biodeposition structures
(D) Laminated structures
(E) Answer not known

170. Which of the following structures is NOT useful in the study of current origin?

(A) Cross bedding
(B) Groove casts
(C) Flow casts
(D) Casts and molds
(E) Answer not known

171. Match the following :

	Sedimentary environment		Sub environment
(a)	Alluvial	1.	tidal marsh
(b)	Glacial	2.	platform
(c)	Marine	3.	flood plain
(d)	Shore zone	4.	kames

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

(E) Answer not known

172. The flat banded cryptocrystalline varieties having white, grey, brown and black bands of color is called as

(A) Onyx
(B) Opal
(C) Calc-tuffa
(D) Travertine
(E) Answer not known

173. The detrital Heavy minerals like anatase, augite, enstatite and hypersthene are characteristics of the source rock type is

(A) Silicic igneous
(B) Mafic igneous
(C) Low rank metamorphic
(D) High grade metamorphic
(E) Answer not known

174. Match the following :

(a)	Epiclastic conglomerate	1.	Gravel
(b)	Intraformal conglomerate	2.	Shale-pebbles
(c)	Oligomictic conglomerate	3.	Pebbles
(d)	Diamictic conglomerate	4.	Tillites

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

(E) Answer not known

175. The secretionary forms of iron and manganese oxides are called as

(A) Concretions
(B) Colouration
(C) Dendrites
(D) Colloids
(E) Answer not known

176. The proper crystallographic faces that are rarely developed in recrystallised metamorphic mineral is termed as

(A) Crystalloblastic
(B) Palimpsest
(C) Idioblastic
(D) Xenoblastic
(E) Answer not known

177. The metamorphic rock rich in pyrope-garnet and omphacite pyroxene is

(A) Amphibolite
(B) Mylonite
(C) Eclogite
(D) Serpentinite
(E) Answer not known

178. Contact metamorphism of calcite and silica at about 500°C, will produce _____

(A) Wollastonite
(B) Anorthite
(C) Tremolite
(D) Diopside
(E) Answer not known

179. Identify the facies where the characteristic mineralogical assemblage is
Glaucophane + Lawsonite + Jadeite + Quartz + Aragonite

(A) Greenschist
(B) Granulite
(C) Blueschist
(D) Zeolite
(E) Answer not known

180. Which one is an example of epi zone?

(A) Sericite – Chlorite – Talc
(B) Biotite – Muscorite – Staurolite
(C) Almandine – Calcite – Brucite
(D) Silliminite – Andalism – Spinel
(E) Answer not known

181. The huge bodies of igneous masses that show both concordant and discordant relations with country rock is called

(A) Volcanic Necks
(B) Batholiths
(C) Ring Dykes
(D) Cone sheets
(E) Answer not known

182. The pyroxene minerals augite, hypersthene or pigeonite are found in _____

(A) Alkali Basalt
(B) High-Al_2O_3 basalt
(C) Tholeiite basalt
(D) Spilite
(E) Answer not known

183. The point at which two constituents crystallize simultaneously is known as

(A) Solid solution
(B) Peritectic point
(C) Solvus point
(D) Eutectic point
(E) Answer not known

184. The term "Mica-diorite" kindred was proposed by

(A) H. Dewey and Sir. J.S. Flett
(B) F. Von Wolf
(C) V.M. Goldschmidt
(D) J.H.L. Vogt
(E) Answer not known

185. The Granodiorite-Andesite Kindred is made up of

(A) Biotite-norite, Biotite-diorite and trondhjemite
(B) Andesite, Dacite, Rhyolite
(C) Peridotite, Olivine-Gabbro to Gabbro
(D) Biotite, Quartz-Diorite and Granodiorite to Granite
(E) Answer not known

186. A potassic-ultrabasic hybrid igneous rock containing large crystals of olivine enstatite, Ca-rich diopside, pyrope-almandine and other minerals, is called

(A) Granite
(B) Syenite
(C) Kimberlite
(D) Anorthosite
(E) Answer not known

187. In a five zone pegmatite, which is the outermost zone is made up of?

(A) Polyminerals
(B) Microcline
(C) Muscovite and feldspar
(D) Quartz and feldspar
(E) Answer not known

188. The eclogite facies has the critical association of which all minerals?

(A) Omphacite and Garnet
(B) Biotite and Orthoclase
(C) Kyanite and Staurolite
(D) Albite and Biotite
(E) Answer not known

189. Which of the following statements are true about metamorphic rock?

(i) Quartzite is a granoblastic metamorphic rock

(ii) Granulite is an even grained rock having a granoblastic texture

(iii) Serpentinite is a rock almost entirely composed of labradorite

(A) (i) only
(B) (ii) and (iii) only
(C) (i) and (ii) only
(D) (i) and (iii) only
(E) Answer not known

190. Find out the metamorphic structure that has porphyroblasts of strong minerals such as andalusite, cordierite and ottrelite type of minerals present.

(A) Porphyroclastic structure
(B) Schistose structure
(C) Maculose structure
(D) Gneissose structure
(E) Answer not known

191. Metamorphic alterations due to the action of super heated steam and fluorine is called as

(A) Greisening
(B) Tourmalinisation
(C) Pneumatolysis
(D) Kaolinisation
(E) Answer not known

192. The product of metasomatism formed at the contact of Granites with limestone are named as ————————.

(A) Amphibole
(B) Granulite
(C) Zeolite
(D) Scarns
(E) Answer not known

193. The eutectic intergrowth of orthoclase and quartz produces ———— texture.

(A) Vesicular
(B) Porphyritic
(C) Trachytic
(D) Graphic Granite
(E) Answer not known

194. The granite rock derived from sedimentary or meta sedimentary source rock then it is assigned as which type?

(A) I
(B) S
(C) M
(D) J
(E) Answer not known

195. The temperature for clinopyroxene at which crystallisation begins

(A) 1185°C
(B) 1200°C
(C) 1175°C
(D) 1070°C
(E) Answer not known

196. In IUGS classification, the QAP diagram 90% plagioclase rich zone represents this rock ————

(A) Granite
(B) Basalt
(C) Anorthosite
(D) Monzonite
(E) Answer not known

197. Which one is an example of femic minerals?

(A) Quartz, Orthoclase, Albite, Anorthite
(B) Leucite, Nepheline, Zircon, Andesine
(C) Albite, Anorthite, Nepheline, Quartz
(D) Acmite, Diopside, Hypersthene, Olivine
(E) Answer not known

198. A massive flow layer of glassy nature from black, brown, red and varigated coloured volcanic rock is

(A) Pitch stone
(B) Perlite
(C) Pumice
(D) Obsidian
(E) Answer not known

199. Zoned crystals are especially common in

(A) Pyroxenes
(B) Amphiboles
(C) Garnet
(D) Mica
(E) Answer not known

200. Poiklitic texture is characterized by the

(A) Preserve of large crystals in fine ground mass
(B) Preserve of small crystal within body of large minerals
(C) Distribution of crystals of same size in fine grained gravel mass
(D) The entire constituents being present in glassy form
(E) Answer not known