D 144458 (Pages : 20) Name.....

Reg. No.....

CALICUT UNIVERSITY COMMON ENTRANCE TEST (CU-CET), APRIL 2026

APPLIED GEOLOGY

Time : Two Hours Maximum : 400 Marks

Each question carries 4 *marks.*
One *mark will be deducted for each wrong answer.*
Answer **all** *questions.*

1. Which of the following is not considered one of the four fundamental components of the earth system ?

   (a) Atmosphere. (b) Hydrosphere.

   (c) Asthenosphere. (d) Biosphere (Biota).

2. Match the atmospheric layers in Group I with their correct characteristics in Group II :

Group I	Group II
A. Troposphere	i. Temperature decreases with altitude, it extends from about 50-90 km.
B. Stratosphere	ii. Well mixed by convection; weather phenomena occur here
C. Mesosphere	iii. Temperature increase with altitude, it contains short-wavelength UV-absorbing moelcular oxygen.
D. Thermosphere	iv. Very dry; contains the ozone layer; tempeature increases with altitude.

   (a) A-ii, B-iv, C-i, D-iii. (b) A-i, B-ii, C-iii, D-iv.

   (c) A-ii, B-iii, C-iv, D-i. (d) A-iv, B-ii, C-iii, D-i.

3. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

   Assertion (A) : The "faint young Sun paradox" questions why early Earth wasn't frozen despite the Sun being 30 % less bright 4.56 billion years ago.

   Reason (R) : Scientists believe that higher concentrations of greenhouse gases, such as CO_2 and CH_4, kept the early earth warm enough to support liquid water.

   (a) Both A and R are true, and R is the correct explanation of A.

   (b) Both A and R are true, but R is not the correct explanation of A.

   (c) A is true, but R is false.

   (d) A is false, but R is true.

4. Identify the wrong statement from the following :

   (a) The greenhouse effect is a natural physical process that keeps Earth warmer than it would be without an atmosphere.

   (b) Global warming refers to the anthropogenic increase in Earth's surface temperature due to the buildup of greenhouse gases.

   (c) The greenhouse effect and global warming and completely interchangeable terms used to describe human-induced climate change.

   (d) Venus has a very high surface temperature primarily because of a massive greenhouse effect.

5. Identify the correct sequence of Earth's major geologic eons from oldes to youngest :

   (a) Phanerozoic- Proterozoic - Archean - Hadean.

   (b) Hadean - Archean - Proterozoic - Phanerozoic.

   (c) Archean - Hadean - Phanerozoic - Proterozoic.

   (d) Proterozoic - Hadean - Archean - Phanerozoic.

6. Identify the correct statement from the following :

   (a) Stratospheric ozone is a harmful pollutant that causes smog near ground level.

   (b) Chlorofluorocarbons (CFCs) are natural greenhouse gases emitted by volcanoes.

   (c) The Keeling curve demonstrates a steady decline in atmospheric CO_2 concentrations since 1958.

   (d) The "ozone hole" refers to a dramatic decrease in stratospheric ozone over Antarctica that occurs primarily during October.

7. Which of the following sets represents the three most abundant constituents of Earth's present atmosphere by volume ?

   (a) Carbon dioxide, Oxygen, Water vapour.

   (b) Nitrogen, Oxygen, Argon.

   (c) Nitrogen, Carbon dioxide, Methane.

   (d) Oxygen, Argon, Chlorofluorocarbons.

8. Match the plate tectonic boundary types in Group I with their respective characteristics in Group II :

Group I	Group II
A. Divergent margin	i. Plates slide past each other horizontally.
B. Convergent margin	ii. Plates move apart, forming mid-ocean ridges and new seafloor.
C. Transform margin	iii. Plates collide, forming deep-sea trenches or large mountain belts.

(a) A-ii, B-iii, C-i. (b) A-iii, B-ii, C-i.

(c) A-i, B-iii, C-ii. (d) A-ii, B-i, C-iii.

9. Which of the following refers to a chain of small lakes in a glacial trough that occupy basins created by glacial erosion ?

(a) Pater noster lakes. (b) Oxbow lakes.

(c) Playas. (d) Sinkholes.

10. Match the groundwater terms in Group I with their corresponding in Group II :

Group I	Group II
A. Aquifer	i. Impermeable layer that prevents water movement.
B. Aquiclude	ii. Percentage of the total volume of rock that consists of pore spaces.
C. Porosity	iii. Permeable rock strata that transmit groundwater freely.
D. Permeability	iv. Ability of a material to transmit a fluid.

(a) A-iii, B-i, C-ii, D-iv. (b) A-i, B-iii, C-iv, D-ii.

(c) A-iii, B-ii, C-i, D-iv. (d) A-ii, B-iv, C-i, D-iii.

11. Given below are two statements marked as Assertion (A) and Reason (A). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Deflation often leads to the formation of desert pavement.

Reason (R) : As wind removes finer particles, the surface becomes covered by a layer of coarse pebbles and cobbles that are too large to be moved by the wind.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

12. Identify the wrong statement from the following regarding glaciers :

(a) Glacial drift refers to all sediments of glacal origin.

(b) Glacial striations are scratches and grooves on bedrock caused by glacial abrasion.

(c) A glacial erratic is a boulder derived from the bedrock immediately near its vicinity.

(d) Glaciers move via plastic flow and slipping along the ground.

13. Identify the correct sequence of features along a passive continental margin, moving from the shoreline towards the deep-ocean basin :

(a) Continental slope - Continental shelf - Continental rise - Abyssal plain.

(b) Continental shelf - Continental slope - Continental rise - Abyssal plain.

(c) Continental shelf - Continental rise - Continental slope - Abyssal plain.

(d) Continental rise - Continental shelf - Continental slope - Abyssal plain.

14. Which of the following stream transport terms is not correctly matched ?

(a) Dissolved load - Material transported in solution.

(b) Suspended load - Fine sediment carried within the body of flowing water.

(c) Bed load - Sediment rolling, sliding, or skipping along the channel bottom.

(d) Saltation - Silt and clay particles kept continuously in suspension by turbulence.

15. Which of the following is an erosional or depositional landscape feature produced by the action of groundwater ?

(a) Point bar.

(b) Barchan dune.

(c) Karst topography.

(d) Inselberg.

16. Match the ocean and shoreline features in Group I with their descriptions in Group II :

Group I	Group II
A. Guyot	i. A submerged, flat-topped seamount
B. Submarne canyon	ii. A deep, steep-sided valley cut into the continental slope
C. Atoll	iii. A continuous ring of coral reef surrounding a central lagoon.
D. Seamount	iv. An isolated volcanic peak that rises above the deep-ocean floor

(a) A-i, B-ii, C-iii, D-iv.

(b) A-iv, B-iii, C-ii, D-i.

(c) A-i, B-iii, C-ii, D-iv.

(d) A-iv, B-ii, C-iii, D-i.

17. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Artesian wells require a confined aquifer

Reason (R) : In a confined aquifer, water is under pressure because it is bounded above and below by impermeable aquicludes (or aquitards)

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

18. Identify the wrong statement from the following regarding the work of running water :

(a) The capacity of a stream is the maximum load of solid particles it can transport.

(b) Competence refers to the maximum particle size a stream can transport.

(c) The competence of a stream is completely independent of its flow velocity.

(d) A stream's capacity is directly related to its discharge.

19. A crystal with axes $a = b \neq c$ and all interaxial angles = 90° belongs to which system ?

(a) Orthorhombic. (b) Tetragonal.

(c) Hexagonal. (d) Trigonal.

20. Match the crystal system in Group I with the correct structural formula in Group II :

Group I	Group II
A. Garnet (Grossular)	i. $X_3Y_2(SiO_4)_3$ where X = Ca^{2+} in dodecahedral site
B. Pyroxene (Augite)	ii. Si:O ratio = 2 : 5, sheet structure
C. Plagioclase Feldspar	iii. Single chain inosilicate, Si:O = 1:3
D. Phyllosilicate	iv. Coupled substitution $Na^{+}Si^{4+} \leftrightarrow Ca^{2+}\ Al^{3+}$

(a) A-ii, B-iii, C-iv, D-i. (b) A-i, B-iv, C-iii, D-ii.

(c) A-i, B-iii, C-iv, D-ii. (d) A-iii, B-i, C-ii, D-iv.

21. Identify the wrong statement from the following :

(a) Kyanite is stable at high-pressure and low-temperature conditions.

(b) Sillimanite is the stable polymorph of Al_2SiO_5 at high temperature and low to moderate pressure.

(c) Andalusite, kyanite and sillimanite are polymorphs with the same chemical formula Al_2SiO_5.

(d) Kyanite has higher symmetry than andalusite and belongs to the monoclinic system.

22. Identify the correct sequence of space group counts from highestt to lowest :

(a) Triclinic > Monoclinic > Orthorhombic > Tetragonal.

(b) Orthorhombic > Monoclinic > Tetragonal > Triclinic.

(c) Monoclinic > Orthorhombic > Tetragonal > Trigonal.

(d) Tetragonal > Orthorhombic > Monoclinic > Triclinic.

23. Which of the following is not correctly matched ?

(a) Carlsbad twin - Orthoclase feldspar.

(b) Pericline twin - Albite.

(c) Brazil win - Quartz.

(d) Polysynthetic twin - Garnet.

24. Match the crystal system (Group I) with the correct Hermann-Mauguin symbol (Group II) :

Group I	Group II
A. Isometric	i. 6/mmm.
B. Hexagonal	ii. 4/m 2/m 2/m
C. Tetragonal	iii. 2/m 2/m 2/m
D. Orthorhombic	iv. 2/m 3.

(a) A-iv, B-i, C-ii, D-iii. (b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iii, C-iv, D-i. (d) A-iii B-iv, C-i, D-ii.

25. Which of the following is not correctly matched ?

(a) Beryl - Emerald. (b) Corundum - Ruby.

(c) Beryl - Peridot. (d) Corundum - Sapphire.

26. Identify the correct sequence of Mohs hardness scale from softest to hardest :

(a) Talc < Gypsum < Calcite < Fluorite < Apatite.

(b) Talc < Gypsum < Fluorite < Calcite < Apatite.

(c) Gypsum < Talc < Calcite < Fluorite < Apatite.

(d) Talc < Calcite < Gypsum < Fluorite < Apatite.

27. Which of the following is not correctly matched ?

(a) Pyrope - $Mg_3Al_2(SiO_4)_3$. (b) Grossular - $Ca_3Al_2(SiO_4)_3$.

(c) Almandine - $Fe_3Al_2(SiO_4)_3$. (d) Andradite - $Ca_3Fe^{2+}{}_2(SiO_4)_3$.

28. Identify the wrong statement from the following :

(a) Pyrite has a hardness of 6-6.5 on the Mohs scale and is harden than Feldspar.

(b) Pyrite belongs to the isometric crystal system and commonly forms cubic or pyritohedral crystals.

(c) Pyrite gives a greenish-black streak and has a specific gravity of approximately 5.

(d) Pyrite is also known as "Fool's Gold" because its gold-like colour can be mistaken for native gold.

29. Match the Feldspar mineral in Group I with its correct description in Group II :

Group I	Group II
A. Albite	i. Potassium end-member, monoclinic.
B. Anorhite	ii. Sodium end-member, triclinic.
C. Orthoclase	iii. High-temperature K-Feldspar, monoclinic.
D. Sanidine	iv. Calcium end-member, triclinic.

(a) A-ii, B-iv, C-i, D-iii. (b) A-iii, B-ii, C-iv, D-i.

(c) A-iv, B-iii, C-ii, D-i. (d) A-i B-iii, C-ii, D-iv.

30. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Uniaxial minerals never show a Bxa (acute bisectrix) interference figure with two isogyres.

Reason (R) : Uniaxial minerals have only one optic axis, whereas a Bxa figure requires two optic axes.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

31. Identify the wrong statement from the following :

(a) Muscovite is a dioctahedral mica.

(b) Biotite is a trioctahedral mica.

(c) Phlogopite is a magnesium-rich mica.

(d) Lepidolite is a calcium-rich mica.

32. Identify the correct sequence of Feldspar composition in the plagioclase series from sodium-rich to calcium-rich :

(a) Albite → Oligoclase → Andesine → Labradorite → Bytownite → Anorthite.

(b) Anorthite → Bytownite → Labradorite → Andesine → Oligoclase → Albite.

(c) Albite → Andesine → Oligoclase → Labradorite → Bytownite → Anorthite.

(d) Oligoclase → Albite → Andesine → Labradorite → Anorthite → Bytownite.

33. Identify the wrong statement from the following :

(a) The extinction angle in orthopyroxene is 0° (parallel extinction) in principal sections.

(b) Clinopyroxenes (augite) show oblique extinction angles up to 48° in the (010) section.

(c) Amphiboles (hornblende) show extinction angles up to 30° in the (010) section.

(d) Olivine shows parallel extinction in all sections irrespective of crystallographic orientation.

34. Match the mineral in Group I with its common colour in hand specimen in Group II :

Group I	Group II
A. Malachite	i. Yellow-brown
B. Azurite	ii. Green
C. Limonite	iii. Blue
D. Pyrite	iv. Brass-yellow

(a) A-ii, B-iii, C-i, D-iv. (b) A-iii, B-ii, C-iv, D-i.

(c) A-iv, B-i, C-ii, D-iii. (d) A-i, B-iv, C-iii, D-ii.

35. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Garnet commonly contains inclusions of other minerals and shows a characteristic "dodecahedral" habit.

Reason (R) : Garnet grows at high pressure and temperature, often enclosing pre-existing minerals.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

36. Which type of unconformity features parallel sedimentary beds exists both above and below a surface of erosion ?

(a) Angular unconformity. (b) Disconformity.

(c) Non-conformity. (d) Fault.

37. Match the Lithostratigraphic units in Group I with their relative sizes in Group II :

Group I	Group II
A. Supergroup	i. The smallest individual rock layer
B. Formation	ii. A subdivsion of a formation
C. Member	iii. The basic, fundamental mapping unit
D. Bed	iv. The largest unit, containing many groups.

(a) A-iv, B-iii, C-ii, D-i. (b) A-i, B-ii, C-iii, D-iv.

(c) A-iv, B-ii, C-iii, D-i. (d) A-iii, B-iv, C-i, D-ii.

38. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : The Gondwana formations are of massive economic importance to India.

Reason (R) : The Gondwana formations contain nearly 98 % of India's coal reserves.

44. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Index fossils are highly useful for dating rock layers.

Reason (R) : A good index fossil comes from a creature that lived for a very, very long time across many geological periods.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

45. Identify the wrong statement regarding the Cenozoic geology of India :

(a) The Himalayas formed during the Cenozoic Era.

(b) The Siwalik system contains rich fossils of ancient mammals.

(c) The Karewa formations are found in the Kashmir valley.

(d) The Tertiary rocks of Kerala contain massive reserves of iron ore.

46. The Dharwar Supergroup in South India is economically very important and is made of rocks from which geological time ?

(a) Precambrian. (b) Paleozoic.

(c) Mesozoic. (d) Cenozoic.

47. The Karewa formation, famous for preserving Pleistocene Lake deposits, is located at :

(a) Kerala. (b) Kashmir.

(c) Assam. (d) Tamil Nadu.

48. Match the formations (Group I) with their best descriptions (Group II) :

Group I	Group II
A. Kutch Basin	i. Famous for marine Jurassic rocks and ammonites
B. Bagh Beds	ii. Marine Cretaceous rocks in Central India
C. Assam Basin	iii. Cenozoic rocks that produce cell
D. Lower Gondwana	iv. Major source of India's coal

(a) A-i, B-ii, C-iii, D-iv. (b) A-iv, B-iii, C-ii, D-i.

(c) A-ii, B-i, C-iv, D-iii. (d) A-iii, B-iv, C-i, D-ii.

49. Sedimentary rock layers that are found completely underneath the lava flows of the Deccan Traps is ———.

(a) Intertrappean beds. (b) Infratrappean beds.

(c) Karewa beds. (d) Gondwana beds.

50. Which intrusive form is structurally controlled by folding axes ?

(a) Sill. (b) Dyke.

(c) Phaccolith. (d) Batholith.

51. Match the textures in Group I with their respective characteristics in Group II :

Group I	Group II
A. Panidiomorphic granular	i. Dominance of euhedral crystals
B. Hypidiomorphic granular	ii. Mixed crystal shapes
C. Allotriomorphic granular	iii. Large crystals in finer matrix
D. Prophyritic	iv. Anhedral grains dominate

(a) A-i, B-ii, C-iv, D-iii. (b) A-ii, B-i, C-iv, D-iii.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-i, D-iii.

52. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Trachytic texture indicates directional flow.

Reason (R) : Feldspar laths align parallel due to the movement or magma

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

53. Identify the incorrect statement :

(a) Laccoliths produce a dome-shaped uplift.

(b) Lopoliths are concave upward.

(c) Dykes are concordant.

(d) Sills are parallel to bedding.

54. Match the Magma differentation in Group I with their Process in Group II :

Group I	Group II
A. Fractional crystallization	i. Separation of early crystals
B. Assmilation	ii. Two liquid phases form
C. Liquid immisciblity	iii. Incorporation of country rock
D. Consanguinity	iv. Genetic relation among rocks

(a) A-i, B-ii, C-iii, D-iv. (b) A-ii, B-i, C-iv, D-iii.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-i, D-iii.

55. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Bowen's discontinuous series forms ferromagnetism minerals.

Reason (R) : Minerals crystallize independently without reaction.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

56. Arrange the stages in magma evolution

(a) Assimilation → Partial melting → Crystallization.

(b) Partial melting → Magma generation → Differentiation.

(c) Differentiation → Crystallization → Melting.

(d) Crystallization → Partial melting → Differentiation

57. Which rock is silica-undersaturated ?

(a) Granite. (b) Syenite.

(c) Nephelinite. (d) Diorite.

58. Which process primarily reduces particle size ?

(a) Deposition. (b) Lithification.

(c) Weathering. (d) Diagenesis.

59. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Conglomerate forms in a high-energy environment.

Reason (R) : Large clasts require strong currents.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

60. Identify the incorrect statement :

(a) Sandstone is arenaceous. (b) Shale is argillaceous.

(c) Conglomerate is rudaceous. (d) Claystone is arenaceous.

61. Match the Sedimentary structures :

Group I	Group II
A. Cross bedding	i. Moving water
B. Ripple	ii. Wave/Current action
C. Mud crack	iii. Settling velocity
D. Graded bedding	iv. Desiccation

(a) A-i, B-ii, C-iii, D-iv.
(b) A-ii, B-i, C-iv, D-iii.
(c) A-i, B-ii, C-iv, D-iii.
(d) A-iv, B-ii, C-i, D-iii.

62. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Heavy minerals concentrate in placer deposits.
Reason (R) : They have higher density.

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

63. Arrange as per the diagenetic processes :

(a) Cementation → Compaction → Lithification.
(b) Compaction → Cementation → Lithification.
(c) Lithification → Compaction → Cementation.
(d) Compaction → Lithification → Cementation.

64. Which is biochemical deposit ?

(a) Coal.
(b) Gypsum.
(c) Sandstone.
(d) Breccia.

65. Metamorphism excludes :

(a) Solid-state change.
(b) Mineralogical change.
(c) Melting.
(d) Texture change.

66. Match the Textures :

Group I	Group II
A. Granoblastic	i. Elongated minerals
B. Lepidoblastic	ii. Platy minerals
C. Nematoblastic	iii. Large crystals
D. Porphyroblastic	iv. Equigranular

(a) A-i, B-ii, C-iii, D-iv. (b) A-ii, B-i, C-iv, D-iii.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-i, D-iii.

67. Identify the wrong statement :

(a) Slate is low-grade. (b) Schist is medium-grade.

(c) Gneiss is high-grade. (d) Marble is foliated.

68. Match the rocks in Group I to its protolith in Group II :

Group I	Group II
A. Slate	i. Basalt
B. Marble	ii. Limestone
C. Quartzite	iii. Sandstone
D. Amphibolite	iv. Shale

(a) A-i, B-ii, C-iii, D-iv. (b) A-iii, B-ii, C-iv, D-i.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-iii, D-i.

69. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Retrograde metamorphism is rare.

Reason (R) : Fluids are lost during the prograde stage.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

70. Arrange metamorphic grade (low→ high) :

(a) Slate→ Phyllite→ Schist → Gneiss.

(b) Gneiss → Schist → Slate → Phyllite.

(c) Schist → Slate → Phyllite → Gneiss.

(d) Slate → Schist → Phyllite → Gneiss.

71. Which of the following best characterizes ultra-high temperature (UHT) metamorphism ?

(a) Metamorphism occurring under low thermal conditions.

(b) Metamorphism developed at exceptionally high temperatures.

(c) Metamorphism dominated by low-pressure conditions.

(d) Metamorphism restricted to near-surface environments.

72. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : In a perfectly elastic deformation of a rock, the strain is instantly and fully recoverable upon the removal of the applied differential stress.

Reason (R) : The deformation occurs due to the propagation of dislocations through the crystal lattice without breaking atomic bonds.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

73. Identify the wrong statement from the following regarding the "Rule of V" for dipping strata crossing a valley :

(a) If a bed dips downstream at an angle steeper than the valley gradient, the V points downstream.

(b) If a bed dips upstream, the V points upstream.

(c) If a bed is horizontal, the outcrop pattern is parallel to the contour lines and forms a V pointing upstream.

(d) If a bed dips downstream at an angle shallower than the valley gradient, the V points downstream.

74. Identify the wrong statement from the following regarding fold geometry and recognition :

(a) The hinge line is the locus of points of maximum curvature on a folded surface.

(b) An antiform is a fold that closes upward, regardless of the relative ages of the strata.

(c) In a plunging fold, the outcrop pattern on a flat horizontal terrain will appear as parallel and straight bands.

(d) The axial surface connects the hinge lines of successive folded surfaces within the structure.

75. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Omission of strata is a common field criterion for recognizing a normal fault striking parallel to the strike of the dipping beds.

Reason (R) : Normal faulting generally causes crustal extension and places younger rocks over older rocks.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

76. Match the foliation and lineation types in Group I with their descriptions in Group II :

Group I	Group II
A. Slaty cleavage	i. Preferred orientation of inequidimensional minerals without distinct segregation
B. Schistosity	ii. Continuous cleavage formed by pervasive parallel alignment of fine-grained phyllosilicates
C. Gneissosity	iii. Intersection of two structural planes such as bedding and cleavage
D. Intersection lineation	iv. Compositional bending alternating between granular and micaceous minerals

(a) A-ii, B-i, C-iv, D-iii. (b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iv, C-i, D-iii. (d) A-iv, B-iii, C-ii, D-i.

77. An erosional surface separating gently dipping younger sedimentary rocks from underlying highly folded and steeply dipping older sedimentary rocks is termed as :

(a) Disconformity. (b) Angular unconformity.

(c) Nonconformity. (d) Paraconformity.

78. Identify the wrong statement from the following regarding outliers and inliers :

(a) An outlier is a mass of younger rock completely surrounded by older rocks in a map view.

(b) An inlier is a mass of older rock completely surrounded by younger rocks.

(c) Inliers are commonly formed by the deep erosion of a structural basin.

(d) Outliers can form as erosional remnants of an extensive horizontal sequence.

79. Match the microfossil groups in Group I with their characteristic compositin and biological affinity in Group II

Group I	Group II
A. Foraminifera	i. Microscopic crustaceans with a bivalved, calcitic carapace
B. Radiolaria	ii. Extinct jawless chordates represented by phosphatic tooth like elements
C. Conodonta	iii. Marine amoeboid protists that typically secrete a calcareou test.
D. Ostracoda	iv. Marine planktonic protists that secrete intricate siliceous skeletons

(a) A-iii, B-iv, C-ii, D-i. (b) A-iv, B-iii, C-i, D-ii.

(c) A-iii, B-i, C-iv, D-ii. (d) A-ii, B-iv, C-iii, D-i.

80. Identify the wrong statement from the following regarding trace fossils (ichnofossils) :

(a) Trace fossils represent the recorded behaviour of organisms, such as resting, dwelling or feeding.

(b) A single species of organism can produce multiple different types of trace fossils depending on its behaviour and the substrate.

(c) Trace fossils are extremely useful for biostratgraphic correlation across wide geographic areas because they evolve rapidly.

(d) The Skolithosichnofacies typically indicates a high-energy, shallow-marine environment with shifting, sandy substrates.

81. Match the trilobite facial suture types in Group I with their definitions in Group II :

Group I	Group II
A. Proparian	i. Suture cuts the posterior margin of the cephalon, inside the genal angle.
B. Opisthoparian	ii. Suture cuts exactly through the genal angle.
C. Gonatoparian	iii. Suture cuts the lateral margin of the cephalon, anterior to the genal angle.
D. Marginal	iv. Suture runs along the very edge of the cephalon, often remaining ventral.

(a) A-ii, B-i, C-iii, D-iv. (b) A-iii, B-i, C-ii, D-iv.

(c) A-i, B-iii, C-iv, D-ii. (d) A-iii, B-ii, C-i, D-iv.

82. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Over the evolutionary history of Ammonoidea, the suture lines became progressively more complex, evolving from goniatitic to ceratitic to ammonitic forms.

Reason (R) : Complex suture lines increased the strength of the shell against hydrostatic pressure, allowing ammonites to inhabit a wider rnage of bathymetric depths.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

83. Identify the wrong statement from the following regarding Graptoloidea evolution :

(a) The evolutionary trend in graptoloids shows a progressive increase in the number of stipes over geological time.

(b) Early Ordovician graptolites frequently had pendant or horizontal rhabdosomes, while later forms were predomiantly scandent.

(c) Thecal morphology evolved from simple straight tubes to hightly complex, hooked, or lobate forms.

(d) Monograptids, characterized by a single uniserial stipe, became the dominant graptoloids during the Silurian.

84. Match the classes of molluscs in Group I with their characteristic morphological features in Group II :

Group I	Group II
A. Gastropoda	i. Bivalved shell with a plane of symmetry passing between the valves; lacks a radula.
B. Pelecypoda (Bivalvia)	ii. Shell is typically a coiled cone lacking interior chambers; it undergoes torsion during development.
C. Cephalopoda	iii. Bivalved shell with a plane of symmetry bisecting the valves; possesses a lophophore.
D. Brachiopoda	iv. Chambered shell connected by a siphuncle; possesses a highly developed radula and beak.

(a) A-ii, B-i, C-iv, D-iii. (b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iii, C-iv, D-i. (d) A-iv, B-i, C-ii, D-iii.

85. The term "tenor" of an ore refers to :

(a) Volume of ore. (b) Metal content in ore.

(c) Type of gangue. (d) Depth of deposit.

86. Match the following :

Group I	Group II
A. Syngenetic deposits	i. Formed after the host rock.
B. Epigenetic deposits	ii. Formed with the host rock.
C. Cyprus type VMS	iii. Island Arc.
D. Kuroko type VMS	iv. Mid-oceanic ridge.

(a) A-i, B-ii, C-iii, D-iv. (b) A-i, B-iii, C-ii, D-iv.

(c) A-ii, B-i, C-iv, D-iii. (d) A-ii, B-iv, C-iii, D-i.

87. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Magmatic segregation forms layered deposits.

Reason (R) : Minerals crystallize at the same temperature from magma.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

88. Which is a late magmatic process ?

(a) Crystal settling. (b) Residual liquid segregation.

(c) Magma intrusion. (d) Fractionation.

89. Immiscible liquid segregation leads to the formation of :

(a) Silicates. (b) Oxides.

(c) Sulfide ores. (d) Carbonates.

90. Which is NOT a hydrothermal deposit structure ?

(a) Stock work. (b) Saddle reef.

(c) Batholith. (d) Ladder vein.

91. Replacement deposits are identified by :

(a) Sharp contacts. (b) Gradual mineral replacement.

(c) Lack of structures. (d) Absence of wall rock.

92. Contact metasomatism typically forms :

(a) Placers. (b) Evaporites.

(c) Laterites. (d) Skarn deposits.

93. Which mineral forms by a metamorphic process ?

(a) Bauxite. (b) Gypsum.

(c) Halite. (d) Graphite.

94. Which mineral is associated with the Kolar Fields ?

(a) Copper. (b) Iron.

(c) Gold. (d) Manganese.

95. Match minerals with type :

Group I	Group II
A. Hematite	i. Iron ore.
B. Bauxite	ii. Aluminium
C. Galena	iii. Lead
D. Chalcopyrite	iv. Copper

(a) A-i, B-ii, C-iii, D-iv. (b) A-ii, B-i, C-iii, D-iv.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iii, B-ii, C-i, D-iv.

96. Thorium in India is mainly found in :

(a) Igneous rocks. (b) Limestone.

(c) Coal. (d) Beach placers.

97. Which is an industrial mineral ?

(a) Gold. (b) Graphite.

(c) Silver. (d) Copper.

98. The interior of the earth is studied by :

(a) Rocks. (b) Seismic waves.

(c) Soil. (d) Springs.

99. Ocean salinity depends on :

(a) Temperature. (b) Evaporation.

(c) River input. (d) All the above.

100. Which is the confirmed meteorite impact crater in the Deccan Volcanic Province ?

(a) Luna. (b) Lonar.

(c) Ramgarh. (d) Dhala.

D 144458 (Pages : 20) Name.....

Reg. No.....

CALICUT UNIVERSITY COMMON ENTRANCE TEST (CU-CET), APRIL 2026

APPLIED GEOLOGY

Time : Two Hours Maximum : 400 Marks

Each question carries 4 *marks.*
One *mark will be deducted for each wrong answer.*
Answer **all** *questions.*

1. Which of the following is not considered one of the four fundamental components of the earth system ?

   (a) Atmosphere. (b) Hydrosphere.

   (c) Asthenosphere. (d) Biosphere (Biota).

2. Match the atmospheric layers in Group I with their correct characteristics in Group II :

Group I	Group II
A. Troposphere	i. Temperature decreases with altitude, it extends from about 50-90 km.
B. Stratosphere	ii. Well mixed by convection; weather phenomena occur here
C. Mesosphere	iii. Temperature increase with altitude, it contains short-wavelength UV-absorbing moelcular oxygen.
D. Thermosphere	iv. Very dry; contains the ozone layer; tempeature increases with altitude.

   (a) A-ii, B-iv, C-i, D-iii. (b) A-i, B-ii, C-iii, D-iv.

   (c) A-ii, B-iii, C-iv, D-i. (d) A-iv, B-ii, C-iii, D-i.

3. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

   Assertion (A) : The "faint young Sun paradox" questions why early Earth wasn't frozen despite the Sun being 30 % less bright 4.56 billion years ago.

   Reason (R) : Scientists believe that higher concentrations of greenhouse gases, such as CO_2 and CH_4, kept the early earth warm enough to support liquid water.

   (a) Both A and R are true, and R is the correct explanation of A.

   (b) Both A and R are true, but R is not the correct explanation of A.

   (c) A is true, but R is false.

   (d) A is false, but R is true.

4. Identify the wrong statement from the following :

   (a) The greenhouse effect is a natural physical process that keeps Earth warmer than it would be without an atmosphere.

   (b) Global warming refers to the anthropogenic increase in Earth's surface temperature due to the buildup of greenhouse gases.

   (c) The greenhouse effect and global warming and completely interchangeable terms used to describe human-induced climate change.

   (d) Venus has a very high surface temperature primarily because of a massive greenhouse effect.

5. Identify the correct sequence of Earth's major geologic eons from oldes to youngest :

   (a) Phanerozoic- Proterozoic - Archean - Hadean.

   (b) Hadean - Archean - Proterozoic - Phanerozoic.

   (c) Archean - Hadean - Phanerozoic - Proterozoic.

   (d) Proterozoic - Hadean - Archean - Phanerozoic.

6. Identify the correct statement from the following :

   (a) Stratospheric ozone is a harmful pollutant that causes smog near ground level.

   (b) Chlorofluorocarbons (CFCs) are natural greenhouse gases emitted by volcanoes.

   (c) The Keeling curve demonstrates a steady decline in atmospheric CO_2 concentrations since 1958.

   (d) The "ozone hole" refers to a dramatic decrease in stratospheric ozone over Antarctica that occurs primarily during October.

7. Which of the following sets represents the three most abundant constituents of Earth's present atmosphere by volume ?

   (a) Carbon dioxide, Oxygen, Water vapour.

   (b) Nitrogen, Oxygen, Argon.

   (c) Nitrogen, Carbon dioxide, Methane.

   (d) Oxygen, Argon, Chlorofluorocarbons.

8. Match the plate tectonic boundary types in Group I with their respective characteristics in Group II :

Group I	Group II
A. Divergent margin	i. Plates slide past each other horizontally.
B. Convergent margin	ii. Plates move apart, forming mid-ocean ridges and new seafloor.
C. Transform margin	iii. Plates collide, forming deep-sea trenches or large mountain belts.

(a) A-ii, B-iii, C-i. (b) A-iii, B-ii, C-i.

(c) A-i, B-iii, C-ii. (d) A-ii, B-i, C-iii.

9. Which of the following refers to a chain of small lakes in a glacial trough that occupy basins created by glacial erosion ?

(a) Pater noster lakes. (b) Oxbow lakes.

(c) Playas. (d) Sinkholes.

10. Match the groundwater terms in Group I with their corresponding in Group II :

Group I	Group II
A. Aquifer	i. Impermeable layer that prevents water movement.
B. Aquiclude	ii. Percentage of the total volume of rock that consists of pore spaces.
C. Porosity	iii. Permeable rock strata that transmit groundwater freely.
D. Permeability	iv. Ability of a material to transmit a fluid.

(a) A-iii, B-i, C-ii, D-iv. (b) A-i, B-iii, C-iv, D-ii.

(c) A-iii, B-ii, C-i, D-iv. (d) A-ii, B-iv, C-i, D-iii.

11. Given below are two statements marked as Assertion (A) and Reason (A). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Deflation often leads to the formation of desert pavement.

Reason (R) : As wind removes finer particles, the surface becomes covered by a layer of coarse pebbles and cobbles that are too large to be moved by the wind.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

12. Identify the wrong statement from the following regarding glaciers :

(a) Glacial drift refers to all sediments of glacal origin.

(b) Glacial striations are scratches and grooves on bedrock caused by glacial abrasion.

(c) A glacial erratic is a boulder derived from the bedrock immediately near its vicinity.

(d) Glaciers move via plastic flow and slipping along the ground.

13. Identify the correct sequence of features along a passive continental margin, moving from the shoreline towards the deep-ocean basin :

(a) Continental slope - Continental shelf - Continental rise - Abyssal plain.

(b) Continental shelf - Continental slope - Continental rise - Abyssal plain.

(c) Continental shelf - Continental rise - Continental slope - Abyssal plain.

(d) Continental rise - Continental shelf - Continental slope - Abyssal plain.

14. Which of the following stream transport terms is not correctly matched ?

(a) Dissolved load - Material transported in solution.

(b) Suspended load - Fine sediment carried within the body of flowing water.

(c) Bed load - Sediment rolling, sliding, or skipping along the channel bottom.

(d) Saltation - Silt and clay particles kept continuously in suspension by turbulence.

15. Which of the following is an erosional or depositional landscape feature produced by the action of groundwater ?

(a) Point bar. (b) Barchan dune.

(c) Karst topography. (d) Inselberg.

16. Match the ocean and shoreline features in Group I with their descriptions in Group II :

Group I	Group II
A. Guyot	i. A submerged, flat-topped seamount
B. Submarne canyon	ii. A deep, steep-sided valley cut into the continental slope
C. Atoll	iii. A continuous ring of coral reef surrounding a central lagoon.
D. Seamount	iv. An isolated volcanic peak that rises above the deep-ocean floor

(a) A-i, B-ii, C-iii, D-iv. (b) A-iv, B-iii, C-ii, D-i.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-iii, D-i.

17. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Artesian wells require a confined aquifer

Reason (R) : In a confined aquifer, water is under pressure because it is bounded above and below by impermeable aquicludes (or aquitards)

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

18. Identify the wrong statement from the following regarding the work of running water :

(a) The capacity of a stream is the maximum load of solid particles it can transport.

(b) Competence refers to the maximum particle size a stream can transport.

(c) The competence of a stream is completely independent of its flow velocity.

(d) A stream's capacity is directly related to its discharge.

19. A crystal with axes $a = b \neq c$ and all interaxial angles = 90° belongs to which system ?

(a) Orthorhombic. (b) Tetragonal.

(c) Hexagonal. (d) Trigonal.

20. Match the crystal system in Group I with the correct structural formula in Group II :

Group I	Group II
A. Garnet (Grossular)	i. $X_3Y_2(SiO_4)_3$ where X = Ca^{2+} in dodecahedral site
B. Pyroxene (Augite)	ii. Si:O ratio = 2 : 5, sheet structure
C. Plagioclase Feldspar	iii. Single chain inosilicate, Si:O = 1:3
D. Phyllosilicate	iv. Coupled substitution $Na^{+}Si^{4+} \leftrightarrow Ca^{2+}\ Al^{3+}$

(a) A-ii, B-iii, C-iv, D-i. (b) A-i, B-iv, C-iii, D-ii.

(c) A-i, B-iii, C-iv, D-ii. (d) A-iii, B-i, C-ii, D-iv.

21. Identify the wrong statement from the following :

(a) Kyanite is stable at high-pressure and low-temperature conditions.

(b) Sillimanite is the stable polymorph of Al_2SiO_5 at high temperature and low to moderate pressure.

(c) Andalusite, kyanite and sillimanite are polymorphs with the same chemical formula Al_2SiO_5.

(d) Kyanite has higher symmetry than andalusite and belongs to the monoclinic system.

22. Identify the correct sequence of space group counts from highestt to lowest :

(a) Triclinic > Monoclinic > Orthorhombic > Tetragonal.

(b) Orthorhombic > Monoclinic > Tetragonal > Triclinic.

(c) Monoclinic > Orthorhombic > Tetragonal > Trigonal.

(d) Tetragonal > Orthorhombic > Monoclinic > Triclinic.

23. Which of the following is not correctly matched ?

(a) Carlsbad twin - Orthoclase feldspar.

(b) Pericline twin - Albite.

(c) Brazil win - Quartz.

(d) Polysynthetic twin - Garnet.

24. Match the crystal system (Group I) with the correct Hermann-Mauguin symbol (Group II) :

Group I	Group II
A. Isometric	i. 6/mmm.
B. Hexagonal	ii. 4/m 2/m 2/m
C. Tetragonal	iii. 2/m 2/m 2/m
D. Orthorhombic	iv. 2/m 3.

(a) A-iv, B-i, C-ii, D-iii. (b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iii, C-iv, D-i. (d) A-iii B-iv, C-i, D-ii.

25. Which of the following is not correctly matched ?

(a) Beryl - Emerald. (b) Corundum - Ruby.

(c) Beryl - Peridot. (d) Corundum - Sapphire.

26. Identify the correct sequence of Mohs hardness scale from softest to hardest :

(a) Talc < Gypsum < Calcite < Fluorite < Apatite.

(b) Talc < Gypsum < Fluorite < Calcite < Apatite.

(c) Gypsum < Talc < Calcite < Fluorite < Apatite.

(d) Talc < Calcite < Gypsum < Fluorite < Apatite.

27. Which of the following is not correctly matched ?

(a) Pyrope - $Mg_3Al_2(SiO_4)_3$. (b) Grossular - $Ca_3Al_2(SiO_4)_3$.

(c) Almandine - $Fe_3Al_2(SiO_4)_3$. (d) Andradite - $Ca_3Fe^{2+}{}_2(SiO_4)_3$.

28. Identify the wrong statement from the following :

(a) Pyrite has a hardness of 6-6.5 on the Mohs scale and is harden than Feldspar.

(b) Pyrite belongs to the isometric crystal system and commonly forms cubic or pyritohedral crystals.

(c) Pyrite gives a greenish-black streak and has a specific gravity of approximately 5.

(d) Pyrite is also known as "Fool's Gold" because its gold-like colour can be mistaken for native gold.

29. Match the Feldspar mineral in Group I with its correct description in Group II :

Group I	Group II
A. Albite	i. Potassium end-member, monoclinic.
B. Anorhite	ii. Sodium end-member, triclinic.
C. Orthoclase	iii. High-temperature K-Feldspar, monoclinic.
D. Sanidine	iv. Calcium end-member, triclinic.

(a) A-ii, B-iv, C-i, D-iii. (b) A-iii, B-ii, C-iv, D-i.

(c) A-iv, B-iii, C-ii, D-i. (d) A-i B-iii, C-ii, D-iv.

30. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Uniaxial minerals never show a Bxa (acute bisectrix) interference figure with two isogyres.

Reason (R) : Uniaxial minerals have only one optic axis, whereas a Bxa figure requires two optic axes.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

31. Identify the wrong statement from the following :

(a) Muscovite is a dioctahedral mica.

(b) Biotite is a trioctahedral mica.

(c) Phlogopite is a magnesium-rich mica.

(d) Lepidolite is a calcium-rich mica.

32. Identify the correct sequence of Feldspar composition in the plagioclase series from sodium-rich to calcium-rich :

(a) Albite → Oligoclase → Andesine → Labradorite → Bytownite → Anorthite.

(b) Anorthite → Bytownite → Labradorite → Andesine → Oligoclase → Albite.

(c) Albite → Andesine → Oligoclase → Labradorite → Bytownite → Anorthite.

(d) Oligoclase → Albite → Andesine → Labradorite → Anorthite → Bytownite.

33. Identify the wrong statement from the following :

(a) The extinction angle in orthopyroxene is 0° (parallel extinction) in principal sections.

(b) Clinopyroxenes (augite) show oblique extinction angles up to 48° in the (010) section.

(c) Amphiboles (hornblende) show extinction angles up to 30° in the (010) section.

(d) Olivine shows parallel extinction in all sections irrespective of crystallographic orientation.

34. Match the mineral in Group I with its common colour in hand specimen in Group II :

Group I	Group II
A. Malachite	i. Yellow-brown
B. Azurite	ii. Green
C. Limonite	iii. Blue
D. Pyrite	iv. Brass-yellow

(a) A-ii, B-iii, C-i, D-iv. (b) A-iii, B-ii, C-iv, D-i.

(c) A-iv, B-i, C-ii, D-iii. (d) A-i, B-iv, C-iii, D-ii.

35. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Garnet commonly contains inclusions of other minerals and shows a characteristic "dodecahedral" habit.

Reason (R) : Garnet grows at high pressure and temperature, often enclosing pre-existing minerals.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

36. Which type of unconformity features parallel sedimentary beds exists both above and below a surface of erosion ?

(a) Angular unconformity. (b) Disconformity.

(c) Non-conformity. (d) Fault.

37. Match the Lithostratigraphic units in Group I with their relative sizes in Group II :

Group I	Group II
A. Supergroup	i. The smallest individual rock layer
B. Formation	ii. A subdivsion of a formation
C. Member	iii. The basic, fundamental mapping unit
D. Bed	iv. The largest unit, containing many groups.

(a) A-iv, B-iii, C-ii, D-i. (b) A-i, B-ii, C-iii, D-iv.

(c) A-iv, B-ii, C-iii, D-i. (d) A-iii, B-iv, C-i, D-ii.

38. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : The Gondwana formations are of massive economic importance to India.

Reason (R) : The Gondwana formations contain nearly 98 % of India's coal reserves.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

39. Identify the wrong statement from the following :

(a) The Law of Superposition states that in undisturbed rocks, the oldest layer is at the bottom.

(b) The Law of Original Horizontally states that sediments are deposited in flat, level layers.

(c) The Law of Cross-Cutting relationships states that a rock cutting through another rock is older than the rock it cuts.

(d) The Principle of Lateral Continuity states that rock layers extend outwards in all directions.

40. Identify the correct sequence of Geological Time Scale units from largest to smallest :

(a) Era - Eon - Epoch - Period. (b) Eon - Era - Period - Epoch.

(c) Period - Era - Eon - Epoch. (d) Eon - Period - Era - Epoch.

41. Which of the following pairs of Indian Rock Groups and their economic importance is NOT correctly matched ?

(a) Dharwar Supergroup - Gold and Iron ore.

(b) Gondwana Formations - Coal.

(c) Tertiary rocks of Assam - Petroleum (Oil).

(d) Vindhyan Supergroup - Massive coal reserves.

42. The Deccan Traps of peninsular India are primarily composed of :

(a) Sedimentary sandstone. (b) Metamorphic marble.

(c) Volcanic basalt rocks. (d) Glacial ice deposits.

43. Match the famous Indian geological regions (Group I) with the geological age they are most famous for (Group II) :

Group I	Group II
A. Kutch Basin	i. Cambrian/Paleozoic
B. Spiti Valley	ii. Triassic
C. Siwalik Hills	iii. Jurassic
D. Salt range	iv. Cenozoic/Tertiary

(a) A-iii, B-ii, C-iv, D-i. (b) A-iv, B-i, C-iii, D-ii.

(c) A-ii, B-iii, C-i, D-iv. (d) A-iii, B-iv, C-ii, D-i.

44. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Index fossils are highly useful for dating rock layers.

Reason (R) : A good index fossil comes from a creature that lived for a very, very long time across many geological periods.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

45. Identify the wrong statement regarding the Cenozoic geology of India :

(a) The Himalayas formed during the Cenozoic Era.

(b) The Siwalik system contains rich fossils of ancient mammals.

(c) The Karewa formations are found in the Kashmir valley.

(d) The Tertiary rocks of Kerala contain massive reserves of iron ore.

46. The Dharwar Supergroup in South India is economically very important and is made of rocks from which geological time ?

(a) Precambrian. (b) Paleozoic.

(c) Mesozoic. (d) Cenozoic.

47. The Karewa formation, famous for preserving Pleistocene Lake deposits, is located at :

(a) Kerala. (b) Kashmir.

(c) Assam. (d) Tamil Nadu.

48. Match the formations (Group I) with their best descriptions (Group II) :

Group I	Group II
A. Kutch Basin	i. Famous for marine Jurassic rocks and ammonites
B. Bagh Beds	ii. Marine Cretaceous rocks in Central India
C. Assam Basin	iii. Cenozoic rocks that produce cell
D. Lower Gondwana	iv. Major source of India's coal

(a) A-i, B-ii, C-iii, D-iv. (b) A-iv, B-iii, C-ii, D-i.

(c) A-ii, B-i, C-iv, D-iii. (d) A-iii, B-iv, C-i, D-ii.

49. Sedimentary rock layers that are found completely underneath the lava flows of the Deccan Traps is ————.

(a) Intertrappean beds. (b) Infratrappean beds.

(c) Karewa beds. (d) Gondwana beds.

50. Which intrusive form is structurally controlled by folding axes ?

(a) Sill. (b) Dyke.

(c) Phaccolith. (d) Batholith.

51. Match the textures in Group I with their respective characteristics in Group II :

Group I	Group II
A. Panidiomorphic granular	i. Dominance of euhedral crystals
B. Hypidiomorphic granular	ii. Mixed crystal shapes
C. Allotriomorphic granular	iii. Large crystals in finer matrix
D. Prophyritic	iv. Anhedral grains dominate

(a) A-i, B-ii, C-iv, D-iii. (b) A-ii, B-i, C-iv, D-iii.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-i, D-iii.

52. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Trachytic texture indicates directional flow.

Reason (R) : Feldspar laths align parallel due to the movement or magma

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

53. Identify the incorrect statement :

(a) Laccoliths produce a dome-shaped uplift.

(b) Lopoliths are concave upward.

(c) Dykes are concordant.

(d) Sills are parallel to bedding.

54. Match the Magma differentation in Group I with their Process in Group II :

Group I	Group II
A. Fractional crystallization	i. Separation of early crystals
B. Assmilation	ii. Two liquid phases form
C. Liquid immisciblity	iii. Incorporation of country rock
D. Consanguinity	iv. Genetic relation among rocks

(a) A-i, B-ii, C-iii, D-iv. (b) A-ii, B-i, C-iv, D-iii.

(c) A-i, B-iii, C-ii, D-iv. (d) A-iv, B-ii, C-i, D-iii.

55. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Bowen's discontinuous series forms ferromagnetism minerals.

Reason (R) : Minerals crystallize independently without reaction.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

56. Arrange the stages in magma evolution

(a) Assimilation → Partial melting → Crystallization.

(b) Partial melting → Magma generation → Differentiation.

(c) Differentiation → Crystallization → Melting.

(d) Crystallization → Partial melting → Differentiation

57. Which rock is silica-undersaturated ?

(a) Granite. (b) Syenite.

(c) Nephelinite. (d) Diorite.

58. Which process primarily reduces particle size ?

(a) Deposition. (b) Lithification.

(c) Weathering. (d) Diagenesis.

59. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Conglomerate forms in a high-energy environment.

Reason (R) : Large clasts require strong currents.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

60. Identify the incorrect statement :

(a) Sandstone is arenaceous. (b) Shale is argillaceous.

(c) Conglomerate is rudaceous. (d) Claystone is arenaceous.

61. Match the Sedimentary structures :

Group I	Group II
A. Cross bedding	i. Moving water
B. Ripple	ii. Wave/Current action
C. Mud crack	iii. Settling velocity
D. Graded bedding	iv. Desiccation

(a) A-i, B-ii, C-iii, D-iv.
(b) A-ii, B-i, C-iv, D-iii.
(c) A-i, B-ii, C-iv, D-iii.
(d) A-iv, B-ii, C-i, D-iii.

62. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Heavy minerals concentrate in placer deposits.
Reason (R) : They have higher density.

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

63. Arrange as per the diagenetic processes :

(a) Cementation → Compaction → Lithification.
(b) Compaction → Cementation → Lithification.
(c) Lithification → Compaction → Cementation.
(d) Compaction → Lithification → Cementation.

64. Which is biochemical deposit ?

(a) Coal.
(b) Gypsum.
(c) Sandstone.
(d) Breccia.

65. Metamorphism excludes :

(a) Solid-state change.
(b) Mineralogical change.
(c) Melting.
(d) Texture change.

66. Match the Textures :

Group I	Group II
A. Granoblastic	i. Elongated minerals
B. Lepidoblastic	ii. Platy minerals
C. Nematoblastic	iii. Large crystals
D. Porphyroblastic	iv. Equigranular

(a) A-i, B-ii, C-iii, D-iv.
(b) A-ii, B-i, C-iv, D-iii.
(c) A-i, B-iii, C-ii, D-iv.
(d) A-iv, B-ii, C-i, D-iii.

67. Identify the wrong statement :

(a) Slate is low-grade.
(b) Schist is medium-grade.
(c) Gneiss is high-grade.
(d) Marble is foliated.

68. Match the rocks in Group I to its protolith in Group II :

Group I	Group II
A. Slate	i. Basalt
B. Marble	ii. Limestone
C. Quartzite	iii. Sandstone
D. Amphibolite	iv. Shale

(a) A-i, B-ii, C-iii, D-iv.
(b) A-iii, B-ii, C-iv, D-i.
(c) A-i, B-iii, C-ii, D-iv.
(d) A-iv, B-ii, C-iii, D-i.

69. Given below are two statements marked as Assertion (A) and Reason (R). Read both carefully and choose the correct alternative :

Assertion (A) : Retrograde metamorphism is rare.
Reason (R) : Fluids are lost during the prograde stage.

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

70. Arrange metamorphic grade (low→ high) :

(a) Slate→ Phyllite→ Schist → Gneiss.
(b) Gneiss → Schist → Slate → Phyllite.
(c) Schist → Slate → Phyllite → Gneiss.
(d) Slate → Schist → Phyllite → Gneiss.

71. Which of the following best characterizes ultra-high temperature (UHT) metamorphism ?

(a) Metamorphism occurring under low thermal conditions.
(b) Metamorphism developed at exceptionally high temperatures.
(c) Metamorphism dominated by low-pressure conditions.
(d) Metamorphism restricted to near-surface environments.

72. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : In a perfectly elastic deformation of a rock, the strain is instantly and fully recoverable upon the removal of the applied differential stress.

Reason (R) : The deformation occurs due to the propagation of dislocations through the crystal lattice without breaking atomic bonds.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

73. Identify the wrong statement from the following regarding the "Rule of V" for dipping strata crossing a valley :

(a) If a bed dips downstream at an angle steeper than the valley gradient, the V points downstream.

(b) If a bed dips upstream, the V points upstream.

(c) If a bed is horizontal, the outcrop pattern is parallel to the contour lines and forms a V pointing upstream.

(d) If a bed dips downstream at an angle shallower than the valley gradient, the V points downstream.

74. Identify the wrong statement from the following regarding fold geometry and recognition :

(a) The hinge line is the locus of points of maximum curvature on a folded surface.

(b) An antiform is a fold that closes upward, regardless of the relative ages of the strata.

(c) In a plunging fold, the outcrop pattern on a flat horizontal terrain will appear as parallel and straight bands.

(d) The axial surface connects the hinge lines of successive folded surfaces within the structure.

75. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Omission of strata is a common field criterion for recognizing a normal fault striking parallel to the strike of the dipping beds.

Reason (R) : Normal faulting generally causes crustal extension and places younger rocks over older rocks.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

76. Match the foliation and lineation types in Group I with their descriptions in Group II :

Group I	Group II
A. Slaty cleavage	i. Preferred orientation of inequidimensional minerals without distinct segregation
B. Schistosity	ii. Continuous cleavage formed by pervasive parallel alignment of fine-grained phyllosilicates
C. Gneissosity	iii. Intersection of two structural planes such as bedding and cleavage
D. Intersection lineation	iv. Compositional bending alternating between granular and micaceous minerals

(a) A-ii, B-i, C-iv, D-iii.

(b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iv, C-i, D-iii.

(d) A-iv, B-iii, C-ii, D-i.

77. An erosional surface separating gently dipping younger sedimentary rocks from underlying highly folded and steeply dipping older sedimentary rocks is termed as :

(a) Disconformity.

(b) Angular unconformity.

(c) Nonconformity.

(d) Paraconformity.

78. Identify the wrong statement from the following regarding outliers and inliers :

(a) An outlier is a mass of younger rock completely surrounded by older rocks in a map view.

(b) An inlier is a mass of older rock completely surrounded by younger rocks.

(c) Inliers are commonly formed by the deep erosion of a structural basin.

(d) Outliers can form as erosional remnants of an extensive horizontal sequence.

79. Match the microfossil groups in Group I with their characteristic compositin and biological affinity in Group II

Group I	Group II
A. Foraminifera	i. Microscopic crustaceans with a bivalved, calcitic carapace
B. Radiolaria	ii. Extinct jawless chordates represented by phosphatic tooth like elements
C. Conodonta	iii. Marine amoeboid protists that typically secrete a calcareou test.
D. Ostracoda	iv. Marine planktonic protists that secrete intricate siliceous skeletons

(a) A-iii, B-iv, C-ii, D-i. (b) A-iv, B-iii, C-i, D-ii.

(c) A-iii, B-i, C-iv, D-ii. (d) A-ii, B-iv, C-iii, D-i.

80. Identify the wrong statement from the following regarding trace fossils (ichnofossils) :

(a) Trace fossils represent the recorded behaviour of organisms, such as resting, dwelling or feeding.

(b) A single species of organism can produce multiple different types of trace fossils depending on its behaviour and the substrate.

(c) Trace fossils are extremely useful for biostratgraphic correlation across wide geographic areas because they evolve rapidly.

(d) The Skolithosichnofacies typically indicates a high-energy, shallow-marine environment with shifting, sandy substrates.

81. Match the trilobite facial suture types in Group I with their definitions in Group II :

Group I	Group II
A. Proparian	i. Suture cuts the posterior margin of the cephalon, inside the genal angle.
B. Opisthoparian	ii. Suture cuts exactly through the genal angle.
C. Gonatoparian	iii. Suture cuts the lateral margin of the cephalon, anterior to the genal angle.
D. Marginal	iv. Suture runs along the very edge of the cephalon, often remaining ventral.

(a) A-ii, B-i, C-iii, D-iv. (b) A-iii, B-i, C-ii, D-iv.

(c) A-i, B-iii, C-iv, D-ii. (d) A-iii, B-ii, C-i, D-iv.

82. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Over the evolutionary history of Ammonoidea, the suture lines became progressively more complex, evolving from goniatitic to ceratitic to ammonitic forms.

Reason (R) : Complex suture lines increased the strength of the shell against hydrostatic pressure, allowing ammonites to inhabit a wider rnage of bathymetric depths.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

83. Identify the wrong statement from the following regarding Graptoloidea evolution :

(a) The evolutionary trend in graptoloids shows a progressive increase in the number of stipes over geological time.

(b) Early Ordovician graptolites frequently had pendant or horizontal rhabdosomes, while later forms were predomiantly scandent.

(c) Thecal morphology evolved from simple straight tubes to hightly complex, hooked, or lobate forms.

(d) Monograptids, characterized by a single uniserial stipe, became the dominant graptoloids during the Silurian.

84. Match the classes of molluscs in Group I with their characteristic morphological features in Group II :

Group I	Group II
A. Gastropoda	i. Bivalved shell with a plane of symmetry passing between the valves; lacks a radula.
B. Pelecypoda (Bivalvia)	ii. Shell is typically a coiled cone lacking interior chambers; it undergoes torsion during development.
C. Cephalopoda	iii. Bivalved shell with a plane of symmetry bisecting the valves; possesses a lophophore.
D. Brachiopoda	iv. Chambered shell connected by a siphuncle; possesses a highly developed radula and beak.

(a) A-ii, B-i, C-iv, D-iii.

(b) A-i, B-ii, C-iii, D-iv.

(c) A-ii, B-iii, C-iv, D-i.

(d) A-iv, B-i, C-ii, D-iii.

85. The term "tenor" of an ore refers to :

(a) Volume of ore.

(b) Metal content in ore.

(c) Type of gangue.

(d) Depth of deposit.

86. Match the following :

Group I	Group II
A. Syngenetic deposits	i. Formed after the host rock.
B. Epigenetic deposits	ii. Formed with the host rock.
C. Cyprus type VMS	iii. Island Arc.
D. Kuroko type VMS	iv. Mid-oceanic ridge.

(a) A-i, B-ii, C-iii, D-iv.

(b) A-i, B-iii, C-ii, D-iv.

(c) A-ii, B-i, C-iv, D-iii.

(d) A-ii, B-iv, C-iii, D-i.

87. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Magmatic segregation forms layered deposits.

Reason (R) : Minerals crystallize at the same temperature from magma.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

88. Which is a late magmatic process ?

(a) Crystal settling.

(b) Residual liquid segregation.

(c) Magma intrusion.

(d) Fractionation.

89. Immiscible liquid segregation leads to the formation of :

(a) Silicates.

(b) Oxides.

(c) Sulfide ores.

(d) Carbonates.

90. Which is NOT a hydrothermal deposit structure ?

(a) Stock work.

(b) Saddle reef.

(c) Batholith.

(d) Ladder vein.

91. Replacement deposits are identified by :

(a) Sharp contacts.

(b) Gradual mineral replacement.

(c) Lack of structures.

(d) Absence of wall rock.

92. Contact metasomatism typically forms :

(a) Placers.

(b) Evaporites.

(c) Laterites.

(d) Skarn deposits.

93. Which mineral forms by a metamorphic process ?

(a) Bauxite.

(b) Gypsum.

(c) Halite.

(d) Graphite.

94. Which mineral is associated with the Kolar Fields ?

(a) Copper.

(b) Iron.

(c) Gold.

(d) Manganese.

95. Match minerals with type :

Group I	Group II
A. Hematite	i. Iron ore.
B. Bauxite	ii. Aluminium
C. Galena	iii. Lead
D. Chalcopyrite	iv. Copper

(a) A-i, B-ii, C-iii, D-iv.

(b) A-ii, B-i, C-iii, D-iv.

(c) A-i, B-iii, C-ii, D-iv.

(d) A-iii, B-ii, C-i, D-iv.

96. Thorium in India is mainly found in :

(a) Igneous rocks. (b) Limestone.

(c) Coal. (d) Beach placers.

97. Which is an industrial mineral ?

(a) Gold. (b) Graphite.

(c) Silver. (d) Copper.

98. The interior of the earth is studied by :

(a) Rocks. (b) Seismic waves.

(c) Soil. (d) Springs.

99. Ocean salinity depends on :

(a) Temperature. (b) Evaporation.

(c) River input. (d) All the above.

100. Which is the confirmed meteorite impact crater in the Deccan Volcanic Province ?

(a) Luna. (b) Lonar.

(c) Ramgarh. (d) Dhala.

D 123844 (Pages : 19) Name.....

Reg. No.....

CALICUT UNIVERSITY CENTRALIZED ENTRANCE TEST (CU-CET)
APRIL 2025

M.Sc. APPLIED GEOLOGY

Time : Two Hours Maximum : 400 Marks

Each question carries 4 marks.
1 mark will be deducted for each wrong answer.

Answer **all** *questions.*

1. Which mineral is hardest on the Mohs scale ?

   (a) Quartz. (b) Talc.

   (c) Diamond. (d) Gypsum.

2. One of the most fundamental principles in geology proposed by James Hutton :

   (a) Law of Uniformitarianism. (b) Law of Faunal Succession.

   (c) Law of Original Horizontality. (d) Principles of Catastrophism.

3. The transformation of existing rock through elevated temperature and pressure :

   (a) Igneous intrusion. (b) Metamorphism

   (c) Sedimentation. (d) Volcanic activity.

4. Match the following geologic principles in Group II with their respective explanations in Group I :

Group I	Group II
A Rocks are initially deposited in horizontal layers	i Law of Superposition
B Geologic processes occurring today are consistent with those in the past	ii Law of Uniformitarianism
C Younger rocks overlie older rocks	iii Cross-cutting relationships
D Intrusions and faults are younger than the rocks they affect	iv Law of Original Horizontality

   (a) A-i, B-iv, C-ii, D-iii (b) A-ii, B-i, C-iv, D-iii

   (c) A-iv, B-iii, C-ii, D-i (d) A-iv, B-ii, C-i, D-iii

5. The main component of soil that is responsible for its fertility :

(a) Sand. (b) Silt.

(c) Clay. (d) Humus.

6. The primary mechanism responsible for the movement of tectonic plates :

(a) Solar wind.

(b) Gravitational pull of the Moon.

(c) Convection currents in the mantle.

(d) Earth's rotation.

7. Why is feldspar abundant in the Earth's crust ?

(a) Feldspar is a recent addition through meteorite impacts.

(b) Feldspar is resistant to erosion and remains unchanged over time.

(c) It forms through biological processes, enhancing its prevalence.

(d) Feldspar is a common product of magmatic processes and is present in various rock types.

8. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Objects weigh less at higher altitudes on Earth's surface compared to lower altitudes.

Reason (R) : The force of gravity weakens with increasing distance from the center of the Earth, causing a reduction in weight at higher elevations.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

9. The Miller-Bravais for the crystallographic face having the crystallographic axes $1a, 1b, \infty c$ is :

(a) (110). (b) (101).

(c) (112). (d) {110}.

10. An open form consisting of three or more parallel faces :

(a) Pinacoid. (b) Prism.

(c) Dome. (d) Sphenoid.

11. Match the crystallographic axes and their respective angular orientations in Group II with corresponding crystal systems in Group I :

Group I	Group II
A Orthorhombic system	i $a \neq b \neq c, \alpha = \gamma = 90°, \beta \neq 90°$
B Monoclinic system	ii $a = b \neq c, \alpha = \beta = 90°, \gamma = 120°$
C Hexagonal system	iii $a \neq b \neq c, \alpha \neq \beta \neq \gamma$
D Triclinic system	iv $a \neq b \neq c, \alpha = \beta = \gamma = 90°$

(a) A-iv, B-i, C-ii, D-iii. (b) A-iii, B-iv, C-ii, D-i.

(c) A-iv, B-iii, C-ii, D-i. (d) A-ii, B-i, C-iv, D-iii.

12. The form symbol which is used to designate the crystal form is :

(a) {101}. (b) [101].

(c) (101). (d) {101).

13. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : There are three types of twinning in crystallography.

Reason (R) : Contact twins and Penetration twins are 2 types of twins in crystallography.

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

14. The two common twin laws exhibited by plagioclase and microcline :

(a) Carlsbad and Manebach law. (b) Albite and Carlsbad law.

(c) Pericline and Carlsbad law. (d) Albite and Pericline law.

15. Existence of two minerals with single chemical composition and different crystal structures is called :

(a) Polytypism. (b) Isotropism.

(c) Polymorphism. (d) Pseudomorphism.

16. Tetragonal system is characterized by the presence of :

(a) 2-fold axis of symmetry. (b) 4-fold axis of symmetry.

(c) 3-fold axis of symmetry. (d) 1 -fold axis of symmetry.

17. Optical indicatrix of uniaxial minerals with positive optic sign is :

(a) Prolate spheroid. (b) Oblate spheroid.

(c) Irregular in shape. (d) Spheroid.

18. The property of the mineral in which it shows different absorption color associated with different vibration directions.

(a) Anisotropism. (b) Pleochroism.

(c) Polarization colors. (d) Birefringence.

19. Identify a mineral from the pyroxene mineral class :

(a) Pyrite. (b) Diopside.

(c) Ilmenite. (d) Sanidine.

20. Match the following minerals with appropriate mineral formula :

Group I	Group II
A Scheelite	i NaCl
B Pyrite	ii FeS_2
C Halite	iii $Al(OH)_3$
D Gibbsite	iv $CaWO_4$

(a) A-i, B-iv, C-ii, D-iii (b) A-iv, B-i, C-ii, D-iii

(c) A-iv, B-ii, C-i, D-iii (d) A-iv, B-iii, C-i, D-ii

21. What is the degree of rotation for a 3-fold axis of symmetry ?

(a) 360°. (b) 60°.

(c) 90°. (d) 120°.

22. Identify the point group associated with Triclinic system :

(a) 4. (b) 622.

(c) 1. (d) 43 m.

23. Which of the following mineral have a covalent bond ?

(a) Sphalerite. (b) Corundum.

(c) Olivine. (d) Amphibole.

24. Match the following minerals with appropriate optical properties :

Group I	Group II
A Anisotropic	i Pyrite
B Isotropic	ii Zircon
C Opaque	iii Plagioclase
D Uniaxial	iv Fluorite

(a) A-iii, B-ii, C-iv, D-iii. (b) A-iii, B-iv, C-i, D-ii.

(c) A-iv, B-iii, C-i, D-ii. (d) A-iv, B-ii, C-i, D-iii.

25. Si : O ratio for sheet/phyllosilicates :

(a) 2 : 5. (b) 1 : 4.

(c) 4 : 11. (d) 2 : 7.

26. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Based on Goldich's Weathering Series, olivine and Ca-plagioclase weather first and most rapidly.

Reason (R) : Olivine and Ca-plagioclase crystallize from high-temperature magma, lack Si and O ; hence, unstable on Earth.

Note : The Goldich's Weathering Series is similar to the Bowen's Reaction Series.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

27. A mineral exhibiting contact twin :

(a) Spinel. (b) Staurolite.

(c) Orthoclase. (d) Flourite.

28. A lateral variation in lithology and fossil assemblage in a formation that result from change in the environment of deposition is called :

(a) Facies. (b) Stratigraphy.

(c) Facies variation. (d) None of the above.

29. The principle of stratigraphy that states 'Sediments in a basin are always deposited horizontally irrespective of the shape of the basin' is :

(a) Law of lateral continuity.

(b) Law of original horizontality.

(c) Law of superposition.

(d) Law of cross-cutting relationships.

30. Who introduced the term strata (singular 'stratum') to denote the layers of sedimentary rocks, thus giving a name to the science of stratigraphy ?

(a) William Smith. (b) Nicolas Steno.

(c) Charles Lyell. (d) James Hutton.

31. One of the following statements is wrong. Identify.

(a) The principle of inclusions is that the inclusions are all younger than the rock in which they are seen.

(b) Sediments in a basin spread out in all directions during deposition.

(c) When something cross-cuts a sedimentary sequence, it is always younger than that sequence.

(d) In a sedimentary sequence, younger of beds occur as we go up from bottom.

32. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : On the basis of the type of fossils in a bed, it is possible to differentiate between the beds at different levels.

Reason (R) : Fossils help in establishing a succession in time of deposition.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

33. Match the type of unconformities in Group II with their respective explanations in Group I

Group I	Group II
A When the layers above and below an erosional border have the same orientation	i Angular conformity
B When sediments are deposited on top of an igneous or metamorphic rock surface that has eroded	ii Disconformity
C There is little visible erosion and parallel strata on both sides of the unconformity	iii Para-conformity
D Strata are deposited above eroded and inclined layers	iv Non-conformity

(a) A-ii, B-iv, C-i, D-iii.

(b) A-iii, B-i, C-iv, D-ii.

(c) A-iv, B-ii, C-iii, D-i.

(d) A-ii, B-iv, C-iii, D-i.

34. The determination of the geological contemporaneity of events in the geological histories of two areas is called :

(a) Stratigraphy.

(b) Lithology.

(c) Correlation.

(d) None of the above.

35. Identify the correct sequence of chronostratigraphic units from the following :

(a) Supergroup - Group - Formation - Member - Bed.

(b) Eonothem - Erathem - System - Series - Stage.

(c) Supergroup - Group - Member - Formation - Bed.

(d) Eonothem - Erathem - System - Series - Age.

36. Which one among the following is mismatched ?

(a) Eon - Eonothem. (b) Era - Erathem.

(c) Epoch - System. (d) Age - Stage.

37. Which one among the following is an example for System ?

(a) Upper Triassic. (b) Cryptozoic.

(c) Paleozoic. (d) Jurassic.

38. Which of the following is a mobile belt ?

(a) Baster. (b) Satpura.

(c) Dharwar. (d) Cuddapah.

39. The Western Dharwar Craton (WDC) and Eastern Dharwar Craton (EDC) are separated by which shear zone :

(a) Chitradurga. (b) Moyar-Bhavani.

(c) Achankovil. (d) Palghat-Cauvery.

40. Which of the following mass extinctions coincided with the Deccan Volcanic Eruptions around 66 Ma ?

(a) Permian-Triassic. (b) Ordovician-Silurian.

(c) Triassic-Jurassic. (d) Cretaceous-Paleogene.

41. Match the following minerals with appropriate regions :

Group I	Group II
A Bauxite	i Mahadek.
B Gold	ii Khetri.
C Uranium	iii East Coast.
D Pyrite	iv Hutti.

(a) A-ii, B-iii, C-iv, D-i. (b) A-iii, B-iv, C-i, D-ii.

(c) A-iv, B-i, C-ii, D-iii. (d) A-i, B-iv, C-ii, D-iii.

42. What is the age of the Delhi Supergroup ?

(a) Archean. (b) Hadean.

(c) Proterozoic. (d) Phanerozoic.

43. Identify the regions not related to carbonatite deposits in India :

(a) Sung Valley.

(b) Sevattur.

(c) Sukinda Ultramafic Complex.

(d) Kamthai.

44. Which of the following states/union territories encompass the majority of Trans Himalayas ?

(a) Jammu and Kashmir.

(b) Ladakh.

(c) Himachal Pradesh.

(d) Uttarakhand.

45. Which one of the following pair of rock and eruptive setting is correctly matched ?

(a) Schoshonite - Subduction zone.

(b) Carbonatite - Ocean Island.

(c) Boninite - Greenstone belt.

(d) Trachyte - Continental rifting

46. Ijolite is the plutonic equivalent of :

(a) Trachyte.

(b) Basalt.

(c) Dacite.

(d) Nephelinites.

47. A coarse grained ultramafic rock :

(a) Granite.

(b) Peridotite.

(c) Gabbro.

(d) Diorite.

48. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Rocks can be classified based on the color index.

Reason (R) : This classification is based on the percentage volume of sodium or dark-coloured minerals present in the rock.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

49. Match the Types of rock classification in Group I with their explanation in Group II :

Group I	Group II
A CIPW classification	i They are Leucocratic, Mesocratic, Melanocratic
B Based on colour index	ii Based on both the silica content and relative proportion of feldspars
C IUGS classification	iii Based on the normative calculation from the bulk chemistry of the rocks.
D Tabular classification	iv On the basis of their actual mineral contents measured in volume percent

(a) A-iii, B-i, C-iv, D-ii.
(b) A-iii, B-ii, C-iv, D-i.
(c) A-iv, B-i, C-iii, D-ii.
(d) A-iii, B-i, C-ii, D-iv.

50. The Tabular classification is not based on :

(a) The mode of occurrence.
(b) SiO_2 percentage and free quartz.
(c) Proportion of K-Feldspar, lime (calcic) and sodic (Na) plagioclase.
(d) MgO-FeO composition.

51. A large intrusion of igneous rock, usually granite, which is irregular in shape and occupies large area, and formed deep beneath the surface of Earth so the rock cooled very slowly. :

(a) Laccolith.
(b) Lopolith.
(c) Batholith.
(d) Xenolith.

52. Identify the correct sequence of solid solution series of plagioclase :

(a) Anorthite - Bytownite - Andesite - Oligoclase - Labradorite - Albite.
(b) Albite - Bytownite - Andesine - Labradorite - Oligoclase - Anorthite.
(c) Anorthite - Bytownite - Andesine - Labradorite - Oligoclase - Albite.
(d) Anorthite - Bytownite - Labradorite - Andesine - Oligoclase - Albite.

53. The characteristic texture of Komatiite :

(a) Spherulitic texture.

(b) Spinifex texture.

(c) Cumulate texture.

(d) Poikilitic texture.

54. Which of the following is an example of chemical weathering ?

(a) Frost action.

(b) Abrasion.

(c) Oxidation.

(d) Exfoliation.

55. What is lithification in the context of sedimentary rock formation ?

(a) The cooling of molten rock.

(b) The process of cementation and compaction of sediments into solid rock.

(c) The transformation of rocks due to high pressure and temperature.

(d) The breaking down of rocks into smaller particles.

56. Which type of sedimentary rock is formed from the accumulation of organic remains, such as shells and coral fragments ?

(a) Sandstone.

(b) Shal.

(c) Limestone.

(d) Conglomerate.

57. In which environment is shale most likely to form ?

(a) Desert sand dunes.

(b) Deep ocean floor.

(c) Volcanic regions.

(d) High mountain ranges.

58. What are mud cracks ?

(a) Fossils found in sedimentary rocks.

(b) Structures formed by the drying and cracking of mud or clay.

(c) Underground fractures in igneous rocks.

(d) Erosional features in riverbeds.

59. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Sedimentary rocks are commonly formed through the process of lithification.

Reason (R) : Lithification is the process by which sediments loss porosity due to pressure from loading.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

60. Match the following sedimentary rocks in Group II and its formation processes in Group I.

Group II	Group I
A Formed from the accumulation of plant and animal remains, often in marine environments.	i Sandstone
B Composed of rounded gravel-sized particles, cemented together.	ii Limestone
C Fine-grained rock formed from the compaction and cementation of silt and clay.	iii Shale
D Comprised of sand-sized particles, often deposited in beach or desert environments.	iv Conglomerate

(a) A-ii, B-iv, C-iii, D-i. (b) A-iv, B-ii, C-i, D-iii.

(c) A-ii, B-iii, C-iv, D-i. (d) A-ii, B-iii, C-i, D-iv.

61. Which of the following is NOT a type of sedimentary rock ?

(a) Sandstone. (b) Basalt.

(c) Conglomerate. (d) Limestone.

62. What is the primary factor that distinguishes breccia from conglomerate ?

(a) Grain size. (b) Composition.

(c) Sorting. (d) Angularity.

63. Halite is commonly associated with which other evaporites :

(a) Gypsum. (b) Calcite.

(c) Quartz. (d) Feldspar.

64. Orogenic, burial and ocean floor are subtypes of which of the following metamorphism ?

(a) Contact Metamorphism. (b) Regional Metamorphism.

(c) Hydrothermal Metamorphism. (d) Fault-zone Metamorphism.

65. Match the following characterizes with appropriate terms :

Group II	Group I
A Increasing metamorphic grade	i Retrograde metamorphism
B A metamorphic agent	ii Prograde metamorphism
C Decreasing grade as a body of rock cools	iii Geothermal gradient
D Relationship between depth and temperature	iv Deviatoric stress

(a) A-ii, B-iv, C-iii, D-i. (b) A-ii, B-iv, C-i, D-iii.

(c) A-ii, B-iii, C-iv, D-i. (d) A-ii, B-iii, C-i, D-iv.

66. Identify the metamorphic mineral assemblage for kyanite zone :

(a) Staurolite, biotite, muscovite, quartz, garnet, plagioclase.

(b) Garnet, biotite, chlorite, muscovite, quartz, albite.

(c) Biotite, chlorite, muscovite, quartz, oligoclase.

(d) Kyanite, biotite, muscovite, quartz, plagioclase.

67. A metamorphic rock that contains omphacite and pyrope :

(a) Granulite. (b) Marble.

(c) Eclogite. (d) Greenschist.

68. Define the mineral assemblage for greenschist facies :

(a) Chlorite + albite + epidote + actinolite ± quartz.

(b) Glaucophane + lawsonite or epidote/zoisite.

(c) Hornblende + plagioclase.

(d) Orthopyroxene + clinopyroxene + plagioclase ± garnet.

69. The Barrovian Facies Series is associated with which of the following ?

(a) High P/T series. (b) Medium P/T series.

(c) Low P/T series. (d) Very low P/T series.

70. What is the approximate temperature range for initiation of metamorphism in a parent rock ?

(a) 200 - 300°C. (b) 300 - 400°C.

(c) 20 - 80°C. (d) 100- 150°C.

71. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Porphyroblasts are commonly associated with contact metamorphism.

Reason (R) : In contact metamorphism, large porphyroblasts of biotite are common.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true

72. The 'line of intersection between two nonparallel surfaces' is called :

(a) Trend. (b) Trace.

(c) Lineation. (d) Plunge.

73. The region of greatest curvature in a fold :

(a) Fold axis. (b) Crest.

(c) Hinge line. (d) Hinge.

74. Match the fault types with the most appropriate characteristics :

Group I	Group II
A Normal Fault	i Plate Boundaries
B Transform Fault	ii Hanging wall move up with respect to the footwall
C Reverse Fault	iii Hanging wall move down with respect to the footwall

(a) A-ii, B-i, C-iii. (b) A-ii, B-iii, C-i.

(c) A-iii, B-ii, C-i. (d) A-iii, B-i, C-ii.

75. Horizontal faults have a dip of _____ and subhorizontal faults have a dip of _____.

(a) 0°, 0° –10°.
(b) 30°, 30° –60°.
(c) 10°,10° – 30°.
(d) 90°, 80° –90°.

76. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Cylindrical folds have straight hinge lines.

Reason (R) : Non-cylindrical folds have straight hinge lines.

(a) Both A and R is true and R is the correct explanation of A.
(b) Both A and R are true and but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

77. Which among the following is found below CCD ?

(a) Radiolaria.
(b) Foraminifera.
(c) Ostracoda.
(d) Coccolithophore.

78. Match the *Lamellibranchia* genera in Group I with their dentition pattern in Group II.

Group I	Group II
A Trigonia	i Desmodont
B Ostrea	ii Dysodont
C Spondylus	iii Schizodont
D Mytilus	iv Isodont

(a) A-iv, B-iii, C-ii, D-i.
(b) A-iii, B-i, C-iv, D-ii.
(c) A-iii, B-i, C-ii, D-iv.
(d) A-ii, B-i, C-iii, D-iv.

79. Trilobites are used for correlation and dating of rocks, since it is a _____.

(a) Macrofossil.
(b) Microfossil.
(c) Nanofossil.
(d) Index fossil.

80. Which among the following is not a dextral form of Gastropoda ?

(a) Murex. (b) Natica.

(c) Voluta (d) Physa

81. A bivalve's two valves are connected by a ———————— with a series of interlocking teeth and sockets that keep the valves aligned, especially when opening and closing.

(a) Pallial line. (b) Umbo.

(c) Hinge. (d) Lunule.

82. In a pelecypod shell, if umbo curve in such a way that the beak points towards each other across the dorsal margin, the umbos are :

(a) Opisthogyrate. (b) Orthogyrate.

(c) Spirogyrate. (d) Prosogyrate.

83. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Pleistocene is within the Tertiary period.

Reason (R) : Pleistocene is popularly known as 'Modern Ice age'.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

84. Which of the following is not a magmatic ore deposit ?

(a) Cu-Ni sulphide deposits. (b) REE deposits.

(c) Diamond in kimberlite. (d) Mesothermal load gold deposits.

85. Match the different ore formation processes with appropriate examples.

Group I	Group II
A Sedimentary	i Pegmatites
B Magmatic	ii Porphyry Cu
C Magmatic-hydrothermal	iii BIF

(a) A-ii, B-i, C-iii. (b) A-ii, B-iii, C-i.

(c) A-iii, B-ii, C-i. (d) A-iii, B-i, C-ii.

86. Which of the following metals are most associated with porphyry deposits (arrange in order of abundance) ?

(a) Au-Ni-Pb.
(b) Cu-Mo-Au.
(c) W-Co-Au.
(d) Mo-Fe-Ni.

87. Which of the following processes hinder the formation of pegmatite deposits ?

(a) Low viscosity of magma.
(b) High rate of diffusion.
(c) High viscosity of magma.
(d) High solidus temperature.

88. Which are of the following are true about the formation of BIF deposits ?

(a) Anoxic conditions-direct transfer of Fe^{2+} to sea-formed during Mid Archean-Early Proterozoic (3.3-2.3 Ga).
(b) Oxic conditions- direct transfer of Fe^{2+} to sea- formed during Mid Archean-Early Proterozoic (3.3-2.3 Ga).
(c) Anoxic conditions-no transfer of Fe^{2+} to sea- formed only during Mid Archean (3.3Ga).
(d) Oxic conditions-direct transfer of Fe^{2+} to sea- formed only during Early Proterozoic (3.3-2.3 Ga).

89. What is the starting magma composition for the formation of skarn deposits ?

(a) Granitic magma.
(b) Basaltic magma.
(c) Granitic and granodioritic magma.
(d) Basaltic and granodioritic magma.

90. Which of the following is not a property of carbonate melt ?

(a) High concentration of SiO_2.
(b) High concentration of CO_2.
(c) Low concentration of SiO_2.
(d) Low viscosity.

91. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Liquid immiscibility is the prime process aiding in the formation of magmatic Ni-Cu deposits.

Reason (R) : On cooling, sulphide melt forms the major component and silicate melt forms the minor component.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

92. Which state is India's leading producer of bauxite, the primary ore for aluminum ?

(a) Odisha. (b) Gujarat.

(c) Chhattisgarh. (d) Maharashtra.

93. Which state in India is the leading producer of coal ?

(a) Odisha. (b) Jharkhand.

(c) Chhattisgarh. (d) Madhya Pradesh.

94. Which state in India is a major producer of mica, contributing significantly to the country's mica production ?

(a) Bihar. (b) Karnataka.

(c) Andhra Pradesh. (d) None of these.

95. In Kerala, glass sand deposits are located in ————————.

(a) Neendakara. (b) Chavara.

(c) Payyangadi. (d) Cherthala.

96. In which Indian state is the Chiria iron ore mine complex situated ?

(a) Jharkhand. (b) Odisha.

(c) Chhattisgarh. (d) Karnataka.

97. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Madhya Pradesh contributes to nearly 50 % of the country's bauxite production.

Reason (R) : The presence of bauxite deposits in Madhya Pradesh is observed in various regions, including Amarkantak Plateau in Shahdol district, Maikala hills, the plateau area of Sarguja-Bilaspur-Raigarh-Katni, Durg, and Balaghat region.

(a) Both A and R is true and R is the correct explanation of A.

(b) Both A and R are true and but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

98. Tummalapalle mine is associated with which mineral ?

(a) Bauxite. (b) Uranium.

(c) Iron. (d) Coal.

99. Mineral oil deposits in India are present in the belt of _____.

(a) North-Eastern Plateau region.

(b) South-Western Plateau region.

(c) Himalayan region.

(d) North-Western region.

100. The East Coast Bauxite deposits of India had formed from :

(a) Khondalite. (b) Kodurite.

(c) Basalt. (d) Charnockite.

D 102513 (Pages : 21) Name.....

Reg. No.....

P.G. ENTRANCE EXAMINATION, APRIL 2024

APPLIED GEOLOGY

Time : Two Hours Maximum : 400 Marks

Each question carries 4 marks.

1 mark will be deducted for each wrong answer.

1. Mohs scale is used to measure the :

   a) Hardness of minerals.
   b) Density of rocks.
   c) Porosity of sediments.
   d) Viscosity of lava.

2. Who is referred to as the 'Father of Modern Geology' ?

   a) Charles Lyell.
   b) James Hutton.
   c) Nicolaus Steno.
   d) Georges Cuvier.

3. The reason for the absence of plate tectonic processes on other planets is due to :

   a) No other planet has lithosphere similar to the Earth.
   b) No other planet's lithosphere is broken into fragments.
   c) No other planet has internal heat energy left to drive such processes.
   d) No other planet has water.

4. Type of rock formed from pre-existing rock due to change in temperature and pressure ?

   a) Igneous.
   b) Sedimentary.
   c) Metamorphic.
   d) Volcanic.

5. What role does humus play in soil fertility ?

   a) Humus decreases soil fertility by absorbing excess nutrients.
   b) Soil fertility is not affected by the presence of humus.
   c) Humus enhances soil fertility by improving water retention and nutrient availability.
   d) Excessive humus leads to soil erosion, reducing overall fertility.

6. Which plate boundary is associated with the formation of new oceanic crust ?

   a) Convergent boundary.

   b) Divergent boundary.

   c) Transform boundary.

   d) Subduction boundary.

7. Which mineral is most abundant in Earth's crust ?

   a) Quartz.

   b) Feldspar.

   c) Calcite.

   d) Biotite.

8. How does the force of gravity change with increasing altitude ?

   a) It increases.

   b) It remains constant.

   c) It decreases.

   d) It becomes zero.

9. The Miller-Bravais for the crystallographic face that has the following intercepts for the crystallographic axes : $1a, \infty b, 1c$ is :

   a) (110).

   b) (101).

   c) (121).

   d) {101}.

10. An open 1-faced form :

   a) Domes.

   b) Sphenoids.

   c) Pinacoids.

   d) Pedions.

11. Match the crystallographic axes and their respective angular orientations in Group II with corresponding crystal systems in Group I :

Group I	Group II
A Triclinic system	i $a = b \neq c, \alpha = \beta = \gamma = 90°$.
B Orthorhombic system	ii $a \neq b \neq c, \alpha \neq \beta \neq \gamma$.
C Monoclinic system	iii $a \neq b \neq c, \alpha = \beta = \gamma = 90°$.
D Tetragonal system	iv $a \neq b \neq c, \alpha = \gamma = 90°, \beta \neq 90°$.

a) A-ii, B-iv, C-iii, D-i.

b) A-iii, B-ii, C-iv, D-i.

c) A-ii, B-iii, C-iv, D-i.

d) A-ii, B-iii, C-i, D-iv.

12. The zone symbol used to define the direction of twin axes is :

a) $\{hkl\}$.

b) (hkl).

c) $[hkl]$.

d) $\{[hkl]\}$.

13. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : Twinning can originate in three different ways.

Reason (R) : Growth twins, transformation twins, and glide or deformation twins are different ways of origin of twinning.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

14. The twin laws that form a contact twin in the mineral orthoclase are :

a) Carlsbad law and Braveno law.

b) Braveno law and Manebach law.

c) Carlsbad law and Manebach law.

d) Albite law and Pericline law.

15. The existence of a mineral with the appearance of another mineral :

a) Pseudomorphism. b) Polytypism.

c) Polymorphism. d) Isotropism.

16. Orthorhombic system is characterized by the presence of :

a) 4-fold axis of symmetry. b) 1-fold axis of symmetry.

c) 2-fold axis of symmetry. d) 3-fold axis of symmetry.

17. The Uniaxial indicatrix of the minerals with the optic sign negative is :

a) Prolate spheroid. b) Oblate spheroid.

c) Irregular in shape. d) Spheroid.

18. Which one of the following properties is observed under plane-polarized light ?

a) Interference color. b) Extinction.

c) Pleochroism. d) Interference figure.

19. Which one of the following is a sulphide ?

a) Olivine. b) Biotite.

c) Pyrrhotite. d) Apatite.

20. Which of the following minerals contain an ionic bond ?

a) Halite. b) Diamond.

c) Stibnite. d) Galena.

21. Match the following minerals with appropriate optical properties.

Group I	Group II
A Magnetite	i Biaxial
B Quartz	ii Isotropic
C Muscovite	iii Uniaxial
D Garnet	iv Opaque

a) A-iv, B-ii, C-iii, D-i.

b) A-iv, B-iii, C-i, D-ii.

c) A-iii, B-ii, C-iv, D-i.

d) A-iii, B-ii, C-i, D-iv.

22. Identify the correct Si : O ratio for double chain silicates/inosilicates :

a) 1 : 2.

b) 4 : 11.

c) 1 : 3.

d) 2 : 7.

23. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Alkali feldspar, muscovite and quartz are residual phases in the Bowen's Reaction Series.

Reason (R) : Residual phases crystallize from water-poor remnant melts.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

24. Carlsbad, Baveno, Albite and Periclase twins belongs to :

a) Penetration Twins.

b) Complex Twins.

c) Contact Twins.

d) Simple Twins.

25. A set of lithological and paleontological characteristics of a sedimentary rock that indicate its particular environment of deposition :

a) Lithology.
b) Facies.
c) Stratigraphy.
d) None of the above.

26. Which one of the following principles says that : 'In a series of undisturbed beds, a bed that overlies another bed is always the younger' ?

a) Law of Original horizontality.
b) Law of Lateral continuity.
c) Law of superposition.
d) Law of cross-cutting relationships.

27. Identify the wrong statement from the following :

a) A sedimentary sequence denotes the relative time of deposition as the beds are one upon the other.
b) Sediments in a basin are always deposited horizontally irrespective of the shape of the basin.
c) In a basin, sediments are spread in all directions during deposition.
d) When something cross-cuts a sedimentary sequence, it is always older than that sequence.

28. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following :

Assertion (A) : A break in sedimentation is called an unconformity. The break may last for a brief period or may be long.

Reason (R) : It may be difficult to locate an unconformity irrespective of the duration of the break.

a) Both A and R is true and R is the correct explanation of A.
b) Both A and R are true and but R is not the correct explanation of A.
c) A is true, but R is false.
d) A is false, but R is true.

29. Match the type of unconformity in Group I with their respective explanation in Group II.

Group I	Group II
A Angular Unconformity	i Develops where sediments are deposited on top of an eroded surface of igneous or metamorphic rocks
B Disconformity	ii Strata on either side of the unconformity are parallel, there is little apparent erosion
C Para-conformity	iii Exists where the layers above and below an erosional boundary have the same orientation
D Non-conformity	iv Strata is deposited on tilted and eroded layers

a) A-iii, B-iv, C-i, D-ii.
b) A-iv, B-iii, C-ii, D-i.
c) A-iv, B-i, C-ii, D-iii.
d) A-ii, B-iii, C-iv, D-i.

30. Identify the correct sequence of lithostratigraphic units from the following :

a) Supergroup - Group - Formation - Member - Bed.
b) Supergroup - Group - Member - Formation - Bed.
c) Eonothem - Erathem - System - Series - Stage.
d) Eonothem - Erathem - System - Series - Age.

31. Which of the following is not correctly matched ?

a) Eonothem - Eon.
b) Erathem - Era.
c) System - Epoch.
d) Stage - Age.

32. Which one among the following is an example for Series ?

a) Phanerozoic.
b) Triassic.
c) Cenozoic.
d) Upper Triassic.

33. A meteorite impact crater in the Deccan Volcanic Province :

a) Lonar.
b) Luna.
c) Ramgarh.
d) Dhala.

39. The northernmost boundary of the Indian plate is marked by :

a) Himalayan Frontal Fault.

b) Main Boundary Thrust.

c) Main Central Thrust.

d) Indus Tsangpo Suture Zone.

40. Which one of the following pair of rock and eruptive setting can be correctly matched ?

a) Boninite - Ocean Island.

b) Schoshonite - Subduction zone.

c) Carbonatite - Continental rifting.

d) Trachyte - Greenstone belt

41. Syenite is the plutonic equivalent of :

a) Dacite. b) Trachyte.

c) Lherzolite. d) Basalt.

42. Course-grained rock that is rich in hypersthene :

a) Gabbro. b) Granite.

c) Charnockite. d) Khondalite.

43. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Rocks can be classified by CIPW classification.

Reason (R) : It is also known as Norm classification.

a) Both A and R is true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

44. Match the Types of rock classification in Group II with their respective description in Group I

Group I	Group II
A On the basis of their actual mineral contents measured in volume percent	i CIPW classification
B Based on both the silica content and relative proportion of feldspars	ii Based on colour index
C They are Leucocratic, Mesocratic, Melanocratic	iii IUGS classification
D Based on the normative calculation from the bulk chemistry of the rocks	iv Tabular classification

a) A-ii, B-i, C-iv, D-iii.
b) A-iv, B-iii, C-ii, D-i.
c) A-iii, B-iv, C-i, D-ii.
d) A-iii, B-iv, C-ii, D-i.

45. A concordant igneous body, with flat bottom and convex upward :

a) Laccolith.
b) Phacolith.
c) Lopolith.
d) Batholith.

46. Which one of the following systems explains peritectic reaction mechanisms ?

a) Albite-Anorthite system.
b) Forsterite-Olivine system.
c) Diopside-Anorthite system.
d) Forsterite-Silica system.

47. The texture in which the rounded crystals of potassic feldspar mantled by white rims of so feldspar :

a) Rapakivi texture.
b) Ophitic texture.
c) Perthite texture.
d) Antiperthite texture.

48. What is the term for the process of breaking down of rocks into smaller particles through physi or chemical means ?

a) Erosion.
b) Weathering.
c) Lithification.
d) None of the above.

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48. What is the term for the process of breaking down of rocks into smaller particles through physical or chemical means ?

a) Erosion.
b) Weathering.
c) Lithification.
d) None of the above.

49. What is the primary process involved in the formation of sedimentary rocks ?

a) Metamorphism.
b) Recrystallization.
c) Diagenesis and lithification.
d) Igneous Activity.

50. How does limestone typically form ?

a) Volcanic activity.
b) Metamorphism of shale.
c) Accumulation of organic remains.
d) Intense heat and pressure on sandstone.

51. Which sedimentary rock type is often associated with significant petroleum and natural gas reservoirs ?

a) Shale.
b) Sandstone.
c) Limestone.
d) Conglomerate.

52. Which sedimentary structure is associated with the drying and cracking of mud or clay ?

a) Ripple marks.
b) Cross-bedding.
c) Mud cracks.
d) Graded bedding.

53. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Sedimentary rocks are commonly formed through the process of lithification.

Reason (R) : Lithification involves the compaction and cementation of loose sediments to form solid rock.

a) Both A and R is true and R is the correct explanation of A.
b) Both A and R are true and but R is not the correct explanation of A.
c) A is true, but R is false.
d) A is false, but R is true.

54. Match the following sedimentary rocks (Group I) and its formation processes (Group II)

Group I	Group II
A Sandstone	i Formed from the accumulation of plant and animal remains, often in marine environments
B Limestone	ii Composed of rounded gravel-sized particles, cemented togethe
C Shale	iii Fine-grained rock formed from the compaction and cementatio of silt and clay
D Conglomerate	iv Comprised of sand-sized particles, often deposited in beach or desert environments

a) A-iv, B-i, C-iii, D-ii.
b) A-iv, B-ii, C-i, D-iii.
c) A-ii, B-iii, C-iv, D-i.
d) A-ii, B-iii, C-i, D-iv.

55. Which of the following is NOT a type of sedimentary rock ?

a) Granite.
b) Sandstone.
c) Shale.
d) Limestone.

56. Which rock is characterized by rounded clasts and is commonly associated with river deposits

a) Conglomerate.
b) Breccia.
c) Coal.
d) Limestone.

57. Which is the primary mineral in rock salt, a common evaporite ?

a) Calcite.
b) Halite.
c) Gypsum.
d) Quartz.

58. Which of the following is not a metamorphic agent ?

a) Temperature.
b) Pressure.
c) Mean stress.
d) Metamorphic fluid.

59. Match the following with appropriate metamorphism types :

Group I	Group II
A Impact Metamorphism	i Regions of high shear stress.
B Fault-zone Metamorphism	ii Orogenic and ocean floor metamorphism
C Regional Metamorphism	iii Granofels/hornfels
D Contact Metamorphism	iv Shock during an impact cratering event

a) A-iv, B-i, C-iii, D-ii.
b) A-iv, B-i, C-ii, D-iii.
c) A-ii, B-iii, C-iv, D-i.
d) A-ii, B-iii, C-i, D-iv.

60. Identify the metamorphic mineral assemblage for chlorite zone :

a) Chlorite, muscovite, quartz, albite.
b) Biotite, chlorite, muscovite, quartz, albite.
c) Biotite, chlorite, muscovite, quartz, oligoclase.
d) Sillimanite, biotite, muscovite, quartz, plagioclase, garnet.

61. A metamorphic rock dominated by hornblende and plagioclase :

a) Quartzite.
b) Amphibolite.
c) Eclogite.
d) Serpentinite.

62. Mineral assemblage for zeolite facies :

a) Prehnite + pumpellyite.
b) Pyralspite garnet + omphacitic pyroxene.
c) Orthopyroxene + clinopyroxene + plagioclase ± garnet.
d) Zeolites.

63. The Franciscan Facies Series is associated with which of the following ?

a) Low P.
b) Medium P.
c) High P, low T.
d) Very low P.

64. Ultra-high temperature (UHT) metamorphism occur in the temperature range of

a) 900- 1100°C.
b) 400 - 500°C.
c) 700 - 800°C.
d) 500 - 800°C.

65. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Recrystallization reduces stored lattice strain energy.

Reason (R) : Recrystallization involves movement of grain boundaries or development of new boundaries.

a) Both A and R is true and R is the correct explanation of A.
b) Both A and R are true and but R is not the correct explanation of A.
c) A is true, but R is false.
d) A is false, but R is true.

66. Which of the following terms is indicative of 'orientation of a geometric element in space' ?

a) Attitude.
b) Pitch.
c) Rake.
d) Strike.

67. Match the stress states with the appropriate equations ———————.

Group I	Group II
A Triaxial	i $\sigma1 = \sigma2 = \sigma3$
B Biaxial	ii $\sigma1 > \sigma2 > \sigma3 \neq 0$
C Hydrostatic	iii. $\sigma1 > 0 > \sigma3, \sigma2 = 0$

a) A-i, B-ii, C-iii.
b) A-ii, B-i, C-iii.
c) A-iii, B-ii, C-i.
d) A-ii, B-iii, C-i.

68. 'Ratio of the shear stress and the shear strain' is called

a) Bulk modulus.
b) Shear modulus.
c) Young's modulus.
d) Poisson's ratio.

69. The interlimb angle for gentle folds is :

a) 0° – 10°.
b) 10°– 60°.
c) 60° –120°.
d) 120°– 180°.

70. Match the systems with appropriate fault types _____.

Group I	Group II
A Normal	i Imbricate fan, duplex
B Reverse	ii Positive flower structure
C Strike-slip	iii Horst, graben

a) A-i, B-ii, C-iii
b) A-ii, B-i, C-iii
c) A-iii, B-i, C-ii
d) A-ii, B-iii, C-i

71. Which of the following are large-scale equivalents of kink folds ?

a) Ptygmatic folds.
b) Chevron folds.
c) Doubly plunging folds.
d) Sheath folds.

72. Hanging-wall block is present _____ the fault plane and footwall block _____ the fault plane.

a) Below, above.
b) Below, below.
c) Above, below.
d) Above, above.

73. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Faults and joints result from brittle deformations.

Reason (R) : Brittle deformation is the permanent change attributed to growth of fractures and/or movement across it.

a) Both A and R is true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

74. Which among the following is not exclusively marine ?

a) Radiolaria. b) Ostracoda.

c) Foraminifera. d) Conodonts.

75. Match the *Lamellibranchia* genera in Group I with their dentition pattern in Group II.

Group I	Group II
A Trigonia	i Desmodont
B Gryphaea	ii Dysodont
C Glycimeris	iii Schizodont
D Mytilus	iv Taxodont

a) A-i, B-iv, C-ii, D-iii. b) A-iii, B-i, C-ii, D-iv.

c) A-iii, B-i, C-iv, D-ii. d) A-i, B-iii, C-iv, D-ii.

76. Identify the wrong statement about Ichnofossils :

a) Not the actual remains of an organism.

b) Organically derived compounds that are preserved in the rocks.

c) Preserved evidences or impressions of the activities of organisms of the past.

d) May include tracks, trails, burrows, footprints and borings.

77. Fossils which are characterized by short geological range (age), wide geographic distribution, rapid evolutionary rate and distinct morphological features.

a) Macrofossils. b) Index fossils.

c) Ichnofossils. d) Pseudofossils.

78. Identify the one belonging to the Hominidae family :

a) Stegodon. b) Epihippus.

c) Stegolophodon. d) Gigantopithecus.

79. Sinistral form of Gastropoda is :

a) Natica. b) Murex.

c) Physa. d) Voluta.

80. Attachment of the soft tissues to the interior of the Bivalve shell is :

a) Pallial line. b) Hinge.

c) Pallial sinus. d) Lunule.

81. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Adductor muscles hold the shell tightly closed when they contract.

Reason (R) : Based on the adductor muscles, species can be isomyarian, anisomyarian, and dimyarian.

a) Both A and R is true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

82. Extinction of Trilobites was during :

a) Devonian. b) Silurian.

c) Carboniferous. d) Permian.

83. Which of the following mineral deposits results from a magmatic ore-forming process ?

a) Chromite. b) Graphite.

c) Gibbsite. d) Gold.

84. Match the following VMS (volcanic-hosted massive sulphides) types with appropriate host lithologies.

Group I	Group II
A Cyprus	i. Turbidites
B Kuroko	ii Mafic volcanics
C Besshi	iii Felsic volcanics

a) A-iii, B-ii, C-i. b) A-ii, B-i, C-iii.

c) A-ii, B-iii, C-i. d) A-iii, B-i, C-ii.

85. Identify the correct combination of minerals formed in greisen deposits :

a) Quartz-kaolinite-montmorillonite-chlorite.

b) Wollastonite-diopside-grossular-andradite.

c) Muscovite-cassiterite-ferberite-tourmaline.

d) Pyrite-arsenopyrite.

86. Formation of pegmatites is a _____ magmatic process. The _____ viscosity of the pegmatitic magma produces coarse grained deposits.

a) Early-stage, low. b) Late-stage, low.

c) Early-stage, high. d) Late-stage, high.

87. Which are of the following conditions are essential for formation of laterite deposits ?

a) High relief-cool climate-less rainfall.

b) Low relief- humid climate-less rainfall.

c) Low relief-dry climate-adequate rainfall.

d) Low relief-humid climate-adequate rainfall.

88. Which of the following is not a skarn deposit ?

a) Fe, Au skarn.
b) Cu, Pb, W, Zn skarn.
c) Mo, Sn skarn.
d) Au, U skarn.

89. Which of the following mineral combinations contain REE (rare earth elements), in association with carbonatite deposits ?

a) Monazite-bastnasite.
b) Apatite-gadolinite.
c) Xenotime-euxenite.
d) Allanite-sphene.

90. Given below are two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following

Assertion (A) : Dunite, peridotite and pyroxenite are the best host rocks for chromite deposits.

Reason (R) : Chromium is enriched in upper mantle relative to the crust.

a) Both A and R is true and R is the correct explanation of A.
b) Both A and R are true and but R is not the correct explanation of A.
c) A is true, but R is false.
d) A is false, but R is true.

91. Which Indian state is the leading producer of bauxite ?

a) Gujarat.
b) Odisha.
c) Maharashtra.
d) None of these.

92. The famous Kolar Gold Fields (KGF) is located in which Indian state ?

a) Karnataka.
b) Tamil Nadu.
c) Andhra Pradesh.
d) Kerala.

93. Which state ranks as the leading producer of coal in India ?

a) Jharkhand.
b) Maharashtra.
c) Karnataka.
d) Rajasthan.

94. The famous Damodar Valley is known for the extraction of which mineral resource ?

a) Limestone. b) Coal.

c) Gold. d) Diamond.

95. The East Coast bauxite deposits play a vital role in supporting the economic growth of the region by contributing to which industry ?

a) Textile. b) Mining.

c) Agriculture. d) Aluminum.

96. Given below is two statements marked as Assertion (A) and Reason (R). Read both the statements carefully and choose the correct alternative from the following.

Assertion (A) : Madhya Pradesh contributes to nearly 30% of the country's bauxite production.

Reason (R) : The presence of bauxite deposits in Madhya Pradesh is observed in various regions, including Amarkantak Plateau in Shahdol district, Maikala hills, the plateau area of Sarguja-Bilaspur-Raigarh-Katni, Durg, and Balaghat region.

a) Both A and R is true and R is the correct explanation of A.

b) Both A and R are true and but R is not the correct explanation of A.

c) A is true, but R is false.

d) A is false, but R is true.

97. Tummalapalle uranium deposit, one of the world's largest, is located in which Indian state :

a) Jharkhand. b) Andhra Pradesh.

c) Rajasthan. d) Madhya Pradesh.

98. Chavara deposit in Kerala is known :

a) Ilmenite. b) Barytes.

c) Kaolin. d) Dolomite.

99. Limestone-rich belt in India :

a) North-Eastern Plateau region.

b) South-Western Plateau region.

c) Himalayan region.

d) North-Western region.

100. Match the mineral belts or regions in Group II with their mineral deposits in Group I :

Group I	Group II
A Lignite Coal	i Chotanagpur
B Limestone	ii Neyveli
C Mineral Oil	iii Aravalli
D Iron Ore	iv Assam

a) A-ii, B-iv, C-iii, D-i.

b) A-ii, B-iii, C-iv, D-i.

c) A-iv, B-iii, C-i, D-ii.

d) A-i, B-ii, C-iv, D-iii.