

**ENTRANCE TEST - 2025**  
**School of Earth & Environmental Sciences**  
**Applied Geology**

**Total Questions: 60**

**Roll No.**

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**Time Allowed: 70 Minutes**

**Important Instructions for Candidates:**

1. Candidates shall compulsorily use only **blue/ black ball point pen**. In no case gel/ink pen or pencil should be used.
2. Compulsorily write your **roll number** in the space provided at the top of this page of the question booklet.
3. Fill up the necessary information in the spaces provided on OMR Answer sheet including **Question Booklet Number** and **Question Booklet Series**.
4. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the **two copies are aligned properly** so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
5. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
6. **Choose only one correct/most appropriate response** for each question among the options A, B, C and D and darken the circle of the appropriate response completely. Incompletely darkened circle is not correctly read by the OMR scanner and no complaint to this effect shall be entertained.
7. **Do not darken more than one circle of option for any question. A question with more than one darkened response shall be considered wrong.**
8. **There will be negative marking for wrong answers. Each wrong answer will lead to deduction of 0.25 marks per wrong answer from the score.**
9. Only those candidates who obtain positive score in Entrance Test shall be eligible for admission.
10. Do not make any stray mark on the OMR sheet as this may lead to errors while scanning.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated, as in such case it will not be properly evaluated by the machine.
12. No Electronic gadgets including calculators, mobiles, smart watches, blue tooth etc. shall be permitted inside the examination hall.
13. Rough work, if any, should be done on the blank sheets provided with the question booklet.
14. Ensure that the OMR Sheet is signed by the Examinee as well as by the invigilator.
15. At the end of the examination, fold the OMR Sheet along the crease on the top and tear off the top strip to separate the Original OMR Sheet from the Duplicate Copy.
16. Hand over the Original OMR answer sheet to the invigilator and retain the candidate's copy of OMR, Question Booklet and Admit card for your reference.
17. If any of the information in the response Sheet/Question Paper has been found missing or not mentioned as stated above, the candidate is solely responsible for that lapse.
18. Any deficiency on the OMR shall be the responsibility of the candidate himself/herself.

1. Which primary elements were formed during the Big Bang and later condensed into stars and galaxies?
  - a) Carbon and Oxygen
  - b) Hydrogen and Helium
  - c) Iron and Nickel
  - d) Nitrogen and Methane
2. The 14 Bravais lattices are based on how many different crystal systems?
  - a) 14
  - b) 7
  - c) 6
  - d) 3
3. What is a defining characteristic of Rapakivi texture?
  - a) Random distribution of mineral grains
  - b) Plagioclase crystals surrounded by orthoclase
  - c) Orthoclase overgrowths on plagioclase
  - d) Plagioclase overgrowths on orthoclase
4. A sandstone classified as a "relatively pure sandstone (S)" based on its composition is formally known by which geological term?
  - a) Wacke
  - b) Conglomerate
  - c) Arenite
  - d) Siltstone
5. Genus *Orohippus* is also called as:
  - a) Mountain horse
  - b) Dawn horse
  - c) Browsing horse
  - d) Equine
6. Which Proterozoic mobile belt links the Northern and Southern Blocks of the Indian Shield and extends into the Shillong Plateau region?
  - a) Eastern Ghats mobile belt
  - b) Pandyan mobile belt
  - c) Satpura mobile belt
  - d) Aravalli mobile belt
7. What is the acceptable limit of arsenic in drinking water as per BIS guidelines?
  - a) 50 µg/L
  - b) 25 µg/L
  - c) 10 µg/L
  - d) 5 µg/L
8. Which of the following represents principal application of radiogenic isotopes?
  - a) Petrological classification
  - b) Geochronology
  - c) Paleomagnetic analysis
  - d) Seismic wave interpretation
9. Lahar is defined as:
  - a) A river of molten lava
  - b) A volcanic lightning storm
  - c) An earthquake before eruption
  - d) A mudflow of volcanic ash and debris
10. The most common mineral in the Earth's crust is:
  - a) Quartz
  - b) Calcite
  - c) Mica
  - d) Feldspar
11. In fractured crystalline rocks, groundwater movement is primarily controlled by:
  - a) Primary porosity
  - b) Permeability
  - c) Secondary porosity
  - d) Specific retention
12. Ozone in the troposphere is considered as:
  - a) A protective layer
  - b) An air pollutant
  - c) A greenhouse gas
  - d) Both (b) and (c)

13. During chemical weathering, feldspar mainly breaks down into:

- Quartz
- Clay minerals
- Sand
- Limestone

14. Which of the following best describes pseudohexagonal symmetry in biotite?

- Biotite truly belongs to the hexagonal crystal system.
- Biotite is orthorhombic but looks monoclinic.
- Biotite appears hexagonal but is actually monoclinic.
- Biotite lacks any recognizable crystal symmetry.

15. Which of the following minerals is idiochromatic?

- Sapphire
- Ruby
- Sphalerite
- Topaz

16. Which of the following is a renewable resource?

- Coal
- Solar energy
- Natural gas
- Uranium

17. Oceanic crust is primarily composed of:

- Sandstone
- Basalt
- Granite
- Limestone

18. Which of the listed stages of diagenesis is described as occurring later and at deeper levels of burial?

- Eodiagenesis
- Mesodiagenesis
- Telodiagenesis
- Initial Diagenesis

19. The age of *Agnatha* is:

- Devonian to Carboniferous
- Devonian to Present
- Ordovician to Present
- Ordovician to Permian

20. The most abundant element in the Earth's crust is:

- Silicon
- Oxygen
- Aluminum
- Iron

21. Minamata disease is primarily caused by:

- Drinking water with high fluoride
- Inhaling industrial smoke
- Poor sanitation practices
- Eating fish contaminated with mercury

22. Which of the following elements is least likely to show significant stable isotope fractionation?

- Sulfur (S)
- Nitrogen (N)
- Lead (Pb)
- Carbon (C)

23. Which of the following is a primary application of stable isotopes in geology?

- Determining the age of a rock
- Identifying mineral composition
- Geothermometry (determining past temperatures)
- Measuring tectonic plate velocities

24. Long-term inhalation of volcanic ash rich in crystalline silica may lead to which of the following lung disease?

- Emphysema
- Bronchitis
- Silicosis
- Tuberculosis

25. Mauna Loa in Hawaii is an example of which type of volcano?

- Composite
- Shield
- Cinder cone
- Dome

26. The process by which sediments become a rock is called:

- Erosion
- Weathering
- Lithification
- Deposition

27. In the primitive condition of Trilobites, pygidium was absent in:

- Paradoxides*
- Ptyoparia*
- Agnostus*
- Nevadia*

28. The feeding apparatus of regular echinoids is called:

- Radula
- Aristotle's lantern
- Beak
- Mandibles

29. Which factor does not significantly affect the porosity of a rock?

- Sorting
- Grain shape
- Cementation
- Depth of the water table

30. Capillary fringe lies:

- below the water table
- above the water table
- within the zone of saturation
- above the land surface

31. What geological condition leads to the formation of a trellis drainage pattern?

- Uniform bedrock composition
- Volcanic cones
- Glacial erosion
- Alternating bands of resistant and less-resistant rocks

32. Which landform is formed when a glacier carves out a bowl-shaped depression at the head of a valley?

- Cirque
- Drumlin
- Arete
- Kettle

33. The Mohs hardness scale, developed by Friedrich Mohs, is a system based on ten specific minerals. This scale provides a measure of:

- The absolute compressive strength of a mineral
- The precise numerical value of a mineral's hardness
- The relative rank of a mineral's resistance to scratching
- The mineral's melting point

34. The layer of the Earth that is liquid is:

- Inner core
- Mantle
- Outer core
- Crust

35. Which of the following is a less common variety of silica cement?

- Syntaxial quartz
- Microcrystalline quartz
- Quartz overgrowth
- Opal

36. Which of the following is not a type of plate boundary?

- Divergent
- Convergent
- Oblique
- Transform

37. Which of the following does not belong to the Eastern Dharwar Craton (EDC)?

- Shelf sediments, pillow volcanics, greywackes, BIF, felsic volcanics
- Pillow volcanics, greywackes, BIF, volcanogenic conglomerate
- Shelf sediments, felsic volcanics, pillow volcanics, greywackes
- Gneissic granites, banded iron formations, metavolcanics, quartzite

38. Which of the following is a fundamental rock unit?

- Supergroup
- Group
- Formation
- Member

39. The term “pica” refers to:

- A habit of eating non-food substances like soil
- Iron deficiency in adults
- Skin rash caused by soil exposure
- Allergic reactions to soil dust

40. Which of the following is a non-radiogenic isotope?

- $^{87}\text{Sr}$
- $^{143}\text{Nd}$
- $^{88}\text{Sr}$
- $^{206}\text{Pb}$

41. Keshan Disease is primarily associated with a deficiency in which element?

- Iron
- Calcium
- Selenium
- Zinc

42. The arsenic in groundwater in West Bengal is released primarily due to:

- Volcanic activity
- Overuse of chemical fertilizers
- Reductive dissolution of iron oxides
- Seepage from industrial sites

43. The rock cycle illustrates the:

- Movement of tectonic plates
- Formation of the solar system
- Interrelationships among the three rock types
- Evolution of life on Earth

44. The point on the Earth's surface directly above an earthquake's focus is called the:

- Hypocenter
- Epicenter
- Fault
- Seismic zone

45. On a fault surface, which feature is used to interpret the direction of past displacement?

- Joint sets
- Stratification lines
- Slickenlines
- Cleavage traces

46. Which of the following isotopes is commonly used to date young groundwater (up to 50 years)?

- Uranium-238
- Carbon-14
- Tritium ( $^3\text{H}$ )
- Potassium-40

47. Which of the following test is used to determine tensile strength of rocks?

- Brazilian test
- Slake durability test
- Point load test
- Standard penetration test

48. The increase in seismic velocity at the 410 km depth is attributed to:

- A change in temperature gradient
- Change from olivine to spinel structure
- Presence of water
- Decrease in pressure

49. The revisit time of Landsat 8 is approximately:

- 1 day
- 8 days
- 16 days
- 30 days

50. The “cut-off grade” in mining refers to:

- The minimum ore concentration considered economically viable
- The maximum depth of mining
- The grade of waste rock
- The grade of processed ore

51. Which drilling method is commonly used for obtaining undisturbed cylindrical rock cores?

- Auger drilling
- Rotary percussion drilling
- Diamond core drilling
- Blast hole drilling

52. Which of the following soil has the maximum variation in particle size?

- Poorly graded soil
- Narrow graded soil
- Narrow graded with low plasticity index
- Well graded soil

53. The heat flow is typically highest in which of the following geological settings?

- Stable continental shields
- Subduction zones
- Mid-ocean ridges
- Cratonic regions

54. In Wenner configuration, what is the typical spacing between the electrodes?

- Unequal spacing
- Spacing varies randomly
- Equal spacing between the electrodes
- No specific spacing rule

55. Which of the following has the shortest wavelength?

- Radio waves
- Microwaves
- Visible light
- Gamma rays

56. A negative Bouguer anomaly is typically indicative of:

- High-density rocks below the surface
- Low-density materials or crustal thinning
- Instrument malfunction
- High elevation areas

57. Which of the following is best suitable type of dam that can transmit the load to the abutments?

- Straight concrete gravity dam
- Buttress dam
- Arch dam
- Embankment dam

58. The rising limbs of convection currents are typically associated with:

- Subduction zones
- Transform faults
- Mid-ocean ridges
- Continental shields

59. Which of the following technique is used to fill the fractures and voids in the rock mass?

- Rock Bolting
- Anchoring
- Grouting
- Rock Sheds

60. Which of the following contributes significantly to radiogenic heat production in the crust?

- Iron and nickel
- Quartz and feldspar
- Carbon and hydrogen
- Uranium, thorium and potassium

# ENTRANCE TEST-2024

## SCHOOL OF EARTH & ENVIRONMENTAL SCIENCES

### APPLIED GEOLOGY

Question Booklet Series

A

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SEAL

- The first stage of the Ocean basin formation where due to the splitting of the continents formation of rift valleys occurs is called :
  - Terminal stage
  - Declining stage
  - Suturing stage
  - Embryonic stage
- Mohorovicic discontinuity is a discontinuity between :
  - Lithosphere and Asthenosphere
  - Crust and Mantle
  - Mantle and core
  - Outer and inner core
- All the connected continents (Pangaea) in Palaeozoic era were surrounded by an Ocean known as :
  - Panthalassa
  - Gondwana
  - Laurasia
  - Tethys Sea
- An ultrabasic igneous rock with minerals olivine and pyroxenes as its major constituents is :
  - Basalt
  - Andesite
  - Peridotite
  - Rhyolite
- An isolated crescent shaped sand dune produced by the action of wind predominantly from one direction is known as :
  - Seif dunes
  - Hairpin dunes
  - Barchans
  - Star dunes
- Soil material (clay, silt, etc.) deposited by the running water of a river is called :
  - Sedimentary rock
  - Moraine
  - Loess
  - Alluvium
- The Abyssal plain is an underwater plain on the deep ocean floor found at a depth of :
  - 3000-6000 Meters
  - 1000-2000 Meters
  - 4000-7000 Meters
  - 1500-2500 Meters
- The soil which is a mixture of clay, sand, silt consists of additional organic matter and is very fertile is known as :
  - Loamy soil
  - Laterite soil
  - Peat soil
  - Chalk soil
- Which of the following minerals shows Rhomboidal cleavage ?
  - Muscovite
  - Calcite
  - Quartz
  - Pyrope
- The ratio of the velocity of light in a vacuum to its velocity in a specific medium gives :
  - Pleochroism
  - Refractive Index
  - Birefringence
  - Optic sign

11. Which of the following four metals are found as oxide ores in nature ?  
(A) Copper, Iron, Lithium, Cobalt  
(B) Zinc, Titanium, Silver, Nickel  
(C) Silver, Cobalt, Copper, Aluminium  
(D) Aluminium, Manganese, Iron, Zinc

12. Which of the following two minerals belong to the pyroxene group ?  
(A) Pyrope and Almandine  
(B) Agate and Jasper  
(C) Augite and Pigeonite  
(D) Paragonite and Lepidolite

13. The point of intersection formed by three or more adjacent faces in a crystal is called :  
(A) Interfacial angle  
(B) Extinction angle  
(C) Solid angle  
(D) 2 V angle

14. The phenomenon of some minerals existing in two crystal systems while still having the same chemical formula is known as :  
(A) Polymorphism  
(B) Dimorphism  
(C) Pseudomorphism  
(D) Isomorphism

15. An arrangement of atoms or molecules in three dimensions and in repetitive pattern forms :  
(A) A space lattice  
(B) Interfacial angle  
(C) Twinins  
(D) Screw axis

16. In some crystals two or more crystals of the same mineral grow together in a series of repeated very thin layers that are parallel or at a slight angle forming twins. Such type of twins are known as :  
(A) Polysynthetic twins  
(B) Cross twins  
(C) Carlsbad twins  
(D) Merohedral twins

17. The characteristic texture of plutonic (intrusive) rocks crystallised from slowly cooling intrusions at greater depths and built up by mutually inter-grown crystals visible by the naked eye is known as :  
(A) Porphyritic Texture  
(B) Phaneritic Texture  
(C) Aphanitic Texture  
(D) Pyroclastic Texture

18. Diorite is a medium-grained intrusive igneous rock. Its fine-grained equivalent is .....  
(A) basalt  
(B) andesite  
(C) pumice  
(D) rhyolite

19. The process whereby a pre-existing igneous, sedimentary, or metamorphic rock undergoes compositional and mineralogical transformations associated with chemical reactions triggered by the reaction of fluids that invade the protolith is known as :  
(A) Anatexis  
(B) Partial Melting  
(C) Migmatization  
(D) Metasomatism

20. High-pressure metamorphism resulting from the crushing and shearing of rock during tectonic movement, mostly along faults is referred to as :

- (A) Contact metamorphism
- (B) Cataclastic metamorphism
- (C) Shock metamorphism
- (D) Regional metamorphism

21. As per Wentworth Scale the average range of size (diameter) of a cobble is :

- (A) 64-256 mm
- (B) 256-320 mm
- (C) 32-64 mm
- (D) 16-32 mm

22. Clastic sedimentary rocks containing silt or clay-sized particles that are less than 0.0625 mm in size with clay minerals are called :

- (A) Rudaceous rocks
- (B) Arenaceous rocks
- (C) Argillaceous rocks
- (D) Calcareous rocks

23. Sedimentary structures that usually occur at the interface of two differing lithologies and grain size and indicate small scale (in Centimeters) groove or irregularities are known as :

- (A) Ripple Marks
- (B) Horizontal bedding
- (C) Sole marks
- (D) Cross bedding

24. The measuring unit of dynamic viscosity is :

- (A) Darcy
- (B) Centimeters
- (C) Millimeters
- (D) Centipoises

25. A variety of coal with 86 -94 percent dry carbon content is :

- (A) Anthracite
- (B) Bituminous
- (C) Sub-bituminous
- (D) Lignite

26. Which is the State in India that produces the largest quantity of Bauxite ?

- (A) Jharkhand
- (B) Madhya Pradesh
- (C) Orissa
- (D) West Bengal

27. A mineral/ore deposit where grains of valuable minerals like gold or rare earths are mixed with sand deposited by a river or glacier is :

- (A) Hydrothermal deposits
- (B) Placer deposits
- (C) Magmatic deposits
- (D) Epithermal deposits

28. Which of the following is not an ore mineral of copper ?

- (A) Cuprite
- (B) Chalcopyrite
- (C) Bornite
- (D) Pyrite

29. The degree of freedom at a Eutectic point of a binary system is :

- (A) One
- (B) Ten
- (C) Twenty
- (D) Zero

30. As per Gold Schmidt's geochemical classification of elements, metals and heavier non-metals that have a low affinity for oxygen and prefer to bond with sulphur to form sulphide type minerals or highly insoluble sulphides are called :

(A) Lithophiles  
(B) Siderophile  
(C) Chalcophile  
(D) Atmophile

31. The ratio of the radius of the cation to the radius of anion gives us the :

(A) Radius ratio  
(B) Coordination number  
(C) Phase rule  
(D) Partition Coefficient

32. Dendrochronology is :

(A) A technique of radiometric dating  
(B) Determination of age based on natural splitting (fission) of Uranium-238  
(C) Technique of dating Varves the Paired layers of outwash gravel and sediments deposited in glacial lakes by retreating ice sheets  
(D) Technique of dating events, artifacts, etc. by using the number and characteristic patterns of annual growth rings of trees

33. In paleomagnetism "Superchron" is a :

(A) Polarity interval of the earth lasting at least 10 million years  
(B) Periods in which the predominant direction of the earth's magnetic field was the same as the present  
(C) Polarity interval of the earth lasting at least one million years  
(D) Periods in which the predominant direction of the earth's magnetic field was the opposite as the present

34. The Mercalli scale is used to measure :

(A) Gravitational pull  
(B) Intensity of an earthquake  
(C) Depth of the Ocean  
(D) Geological structures

35. Secondary seismic waves cannot travel through :

(A) Gases  
(B) Solids  
(C) Vacuum  
(D) Liquids

36. A geophysical exploration method in which the bulk electric property of all materials that shows how strongly it opposes the flow of electric current is used is known as :

(A) Seismic method  
(B) Magnetic method  
(C) Gravity method  
(D) Resistivity method

37. As per WHO standards the permissible limit of fluoride in drinking water is :

(A) 1- 1.5 mg/L  
(B) 0.5- 0.8 mg/L  
(C) 1.5- 2 mg/L  
(D) 2- 3 mg/L

38. A relatively small body of water occurring above the regional water table with an impermeable base under which lies an unsaturated zone is called :

(A) Unconfined aquifer  
(B) Confined aquifer  
(C) Perched aquifer  
(D) Karst aquifer

39. Measuring unit of permeability is :  
(A) Millilitres  
(B) Cubic meters  
(C) Millidarcy  
(D) Litre

40. Geological formation which is neither porous nor permeable and cannot store water in it and at the same time it cannot permit water through it, is a :  
(A) Confined aquifer  
(B) Aquifuge  
(C) Aquiclude  
(D) Aquitard

41. Contour line in a geological map is a line :  
(A) That joins points of equal pressure in a map  
(B) That joins points of equal temperature in a map  
(C) That joins points of equal precipitation in a map  
(D) That joins points of equal elevation in a map

42. What type of fault is associated with the creation of Horst and Graben ?  
(A) Reverse fault  
(B) Thrust fault  
(C) Normal fault  
(D) Strike Slip fault

43. The sense of movement across a boundary, such as a fault in which the left side opposite the observer moves is known as :  
(A) Opposite  
(B) Sinistral  
(C) Parallel  
(D) Dextral

44. What is hade in a fault ?  
(A) It is the inclination of the fault plane with vertical  
(B) It is the inclination of the fault plane with horizontal  
(C) It is the inclination of fault with any strata  
(D) It is the bearing of the fault with the ground

45. Shallow-focus earthquakes occur at :  
(A) Convergent plate boundary  
(B) Divergent plate boundary  
(C) Transform plate boundary  
(D) None of these

46. The Indian subcontinent broke away from the southern part of Pangea at around :  
(A) 70 Ma  
(B) 90 Ma  
(C) 110 Ma  
(D) 130 Ma

47. Drucker-Prager Failure theory is dependent upon :  
(A) Pressure  
(B) Temperature  
(C) Rock strength  
(D) None of the Above

48. Hotspots are thought to be the surface expressions of:  
(A) Listric faults  
(B) Mantle plumes  
(C) Magma chambers  
(D) Igneous dykes

49. The roots of *Glossopteris* and *Gangamopteris* plants are called :  
(A) Thinnfeldia  
(B) Sigillaria  
(C) Vertibraria  
(D) Nilssonia

50. Trilobite genera that existed in the Cambrian included :  
(A) *Abadiella*, *Judomia*, *Paradoxides*, and *Olenus*  
(B) *Cyclopyge*, *Cheirurus*, *Parabolina*, and *Trinucleus*  
(C) *Dalmanites*, *Encrinurus*, *Calymene*, and *Paralejurus*  
(D) *Archegonus*, *Hesslerides*, *Endops*, and *Triproetus*

51. The forest-dwelling dog sized-horse from which the modern horse evolved belonged to the genus :  
(A) Equis  
(B) Loxodonta  
(C) Eohippus  
(D) Australopithecus

52. Dinosaurs went extinct :  
(A) At the end of the Carboniferous  
(B) At the end of the Permian  
(C) At the end of the Ordovician  
(D) At the end of the Cretaceous

53. Rannibennur, Chitradurga, and Bababudan are the stratigraphic units of :  
(A) Cuddapah supergroup  
(B) Dharwar supergroup  
(C) Vindhyan supergroup  
(D) Gondwana supergroup

54. The Karewa Lake in Kashmir existed during :  
(A) Carboniferous  
(B) Jurassic  
(C) Cretaceous  
(D) Pleistocene

55. In Stratigraphy, a part of the formation which has some remarkable lithology or some characteristic fossil assemblage is demarcated as :  
(A) Complex  
(B) Group  
(C) Member  
(D) Bed

56. Pinjor and Tatrot formations belong to :  
(A) Upper Siwaliks  
(B) Jutogh Group  
(C) Middle Siwaliks  
(D) Salkhala Group

57. The speed of electromagnetic waves in a vacuum is :  
(A)  $2.25 \times 10^8$  m/s  
(B)  $3 \times 10^8$  m/s  
(C)  $2.45 \times 10^8$  m/s  
(D)  $2 \times 10^8$  m/s

58. Albedo of fresh snow ranges between :  
(A) 75-90 %  
(B) 05-10%  
(C) 10-15%  
(D) 40-45%

59. Which law states that a good absorbent of heat is also a good radiator ?  
(A) Stefan's Law  
(B) Kirchoff's Law  
(C) Plank's Law  
(D) Wien's Law

60. Which colour has the highest wavelength in Electromagnetic Spectrum ?  
(A) Violet  
(B) Red  
(C) Orange  
(D) Indigo