



Booklet Series

B

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PAPER/II-06/GEOLOGY

B

Roll No. : _____

Name of the Candidate : _____

Test Duration : 03 Hours

Total Questions : 100

Total Maximum Marks : 200

INSTRUCTIONS TO CANDIDATES

1. Candidates will be admitted to the Examination Hall/Room on production of their Admit Card and Original ID such as **EPIC/Aadhaar/Driving License** with a view to establish the true identity of the candidate.
2. Candidates shall reach the venue of examination at least 30 minutes in advance and admission will be refused to a candidate who is late by 10 minutes from the start of the examination.
3. No candidate shall be permitted to leave the Examination Hall/Room until the time for the examination is over or until permitted to do so but not until the half of the allotted time.
4. Candidates must use a **BLUE/BLACK** ball point pen **ONLY** to make entries on the OMR Answer Sheet.
5. The candidates should not bring any articles (other than those specified above) such as books, notes, loose sheets, mobile phones, pagers, digital diaries, calculators, smart watches, etc. inside the Examination Hall/Room. Any candidate found in possession of the said articles will be liable to be de-barred from applying all future examinations to be conducted by the Board.
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13. **Change of answer will not be permitted in the OMR Answer Sheet. Using of correcting fluid (of any sort) will be treated as wrong attracting negative marking.**
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17. Examination centre once opted cannot be changed.

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SEAL



1. Fossils provide evidence for
 - (A) Future predictions
 - (B) Magnetic fields
 - (C) Organic evolution
 - (D) None of the above
2. Which feature is characteristic of ammonoids that helps in classification ?
 - (A) Soft body
 - (B) Radial symmetry
 - (C) Suture lines
 - (D) Growth rings
3. What is a mitigation method for soil degradation in agriculture ?
 - (A) Excess irrigation
 - (B) Crop rotation and contour farming
 - (C) Urbanization
 - (D) Deforestation
4. Which of the following best defines a "man-induced environmental change" ?
 - (A) Glacier movement
 - (B) Formation of sedimentary rocks
 - (C) Earthquake
 - (D) Sea level rise due to climate change



5. The system of crystallographic notation used worldwide is known as the
 - (A) Miller indices
 - (B) Schroeder notation
 - (C) International Crystallographic System
 - (D) None of the above
6. A substance that does not form a crystal structure is classified as a
 - (A) Crystal
 - (B) Mineral
 - (C) Non-crystalline substance
 - (D) Gemstone
7. Karst topography is primarily developed in which rock type ?
 - (A) Granite
 - (B) Basalt
 - (C) Limestone
 - (D) Shale
8. Which of the following drainage patterns indicates a structurally controlled environment ?
 - (A) Dendritic
 - (B) Trellis
 - (C) Radial
 - (D) Annular





9. What is the main optical property that distinguishes between muscovite and biotite ?

- (A) Refractive index
- (B) Interference color
- (C) Birefringence
- (D) Pleochroism

10. In crystal chemistry, the coordination number refers to

- (A) The number of cleavage directions
- (B) The number of electrons in outer shell
- (C) The number of atoms bonded to a central atom
- (D) The number of crystallographic axes

11. The process by which X-rays are used to study the internal structure of crystals is called

- (A) Diffraction
- (B) Refraction
- (C) Reflection
- (D) Transmission

12. Which of the following is not one of the 32 classes of crystal symmetry ?



- (A) Triclinic
- (B) Tetragonal
- (C) Hexagonal
- (D) Spheroid

13. Which optical accessory is used to enhance the visibility of interference colors in optical mineralogy ?

- (A) Polarizer
- (B) Analyzer
- (C) Retardation plate
- (D) Bertrand lens

14. Which property is used to distinguish between isotropic and anisotropic minerals ?



- (A) Cleavage
- (B) Color
- (C) Hardness
- (D) Birefringence

15. Which of the following is considered a microfossil ?



- (A) Trilobite
- (B) Ammonite
- (C) Foraminifera
- (D) Coral


16. Which of the following is a brachiopod ?

- (A) Nautilus
- (B) Lingula
- (C) Echinoid
- (D) Trilobite



17. Which of the following is not a principal method of mining ?

- (A) Open-pit mining
- (B) Subsurface mining
- (C) Strip mining
- (D) Electro-mining

 18. Which term refers to the process of increasing the concentration of valuable minerals in ore ?

- (A) Prospecting
- (B) Beneficiation
- (C) Sampling
- (D) Sedimentation

19. Gondwana flora is significant because

- (A) It contains only gymnosperms
- (B) It is found only in Antarctica
- (C) It contains mostly algae and fungi
- (D) It shows evidence of continental drift and ancient climate

20. Which group represents the earliest jawless vertebrates in fossil records ?

- (A) Amphibians
- (B) Agnatha
- (C) Reptiles
- (D) Mammals

21. How do tectonic movements contribute to natural geo-hazards ?

- (A) By enriching the soil
- (B) By causing earthquakes and volcanic eruptions
- (C) By reducing erosion
- (D) By creating fertile plains

22. Which of the following is not a mitigation strategy for natural disasters ?

- (A) Building in flood-prone areas
- (B) Early warning systems
- (C) Zoning and land use planning
- (D) Reforestation

23. The age of the Earth is approximately



- (A) 2.5 billion years
- (B) 3.5 billion years
- (C) 4.5 billion years
- (D) 5.5 billion years

24. Sea-floor spreading is best explained by



- (A) Plate collision
- (B) Plate subduction
- (C) Divergence of tectonic plates at mid-ocean ridges
- (D) None of the above



25. The plane of symmetry in a crystal is defined as

- (A) A line that divides the crystal into two equal parts
- (B) A plane that divides the crystal into two equal parts
- (C) The crystal's axis of rotation
- (D) The crystal's central point

26. Twinning in crystals occurs when

- (A) The crystal growth is interrupted
- (B) Crystals form from different minerals
- (C) The crystal breaks during growth
- (D) Two crystals grow in a symmetrical relationship

27. Inselbergs are associated with which geomorphic cycle ?

- (A) Youth
- (B) Maturity
- (C) Glacial Cycle
- (D) Arid Cycle



28. The Peninsular Plateau of India primarily exhibits which type of geomorphic feature ?



- (A) Residual hills and broad valleys
- (B) Recently formed fold mountains
- (C) Glacial moraines
- (D) Sand dunes

29. Which of the following is a major source of iron ore in India ?



- (A) Bauxite
- (B) Copper
- (C) Manganese
- (D) Hematite

30. Which is the most important form of gold deposits ?

- (A) Pegmatites
- (B) Sedimentary deposits
- (C) Alluvial deposits
- (D) Vein deposits

31. The Tectonic Framework of India is characterized by



- (A) Active plate boundaries and frequent volcanic activity
- (B) A stable continental shield and active seismic zones
- (C) Frequent glaciation and mountain building
- (D) Uniform tectonic features across the entire country

32. The mechanism of faulting is most commonly associated with

- (A) Horizontal compressive stress
- (B) Vertical compressive stress
- (C) Horizontal tensile stress
- (D) Differential temperature stress



33. Which of the following is a type of soil degradation ?

- (A) Soil profile development
- (B) Soil erosion
- (C) Soil fertility
- (D) Soil compaction by plants

34. Which component is not part of a natural ecosystem ?



- (A) Plants
- (B) Animals
- (C) Rocks
- (D) Plastic

35. Island arcs are usually formed due to

- (A) Sea-floor spreading
- (B) Collision of continental plates
- (C) Mantle plumes
- (D) Subduction of oceanic plate under another oceanic plate

36. Geosynclines are

- (A) Depositional basins that may form mountains
- (B) Erosional landforms
- (C) Fault zones
- (D) None of the above

37. In crystallography, a lattice is defined as



- (A) A two-dimensional structure of points
- (B) A three-dimensional structure of points
- (C) A collection of identical crystals
- (D) The boundary of a crystal

38. The stereographic projection in crystallography is used to

- (A) Identify crystal symmetry
- (B) Measure the crystal's density
- (C) Determine the crystal's color
- (D) Analyze the crystal's chemical composition

39. What does the stress ellipsoid represent in structural geology ?

- (A) Temperature distribution in rocks
- (B) Distribution of stress in a rock
- (C) Orientation of rock layers
- (D) None of the above

40. Which of the following types of faults is formed by horizontal compressive stress ?



- (A) Reverse fault
- (B) Normal fault
- (C) Strike-slip fault
- (D) Graben



41. Which of the following minerals is an example of framework silicate ?
(A) Olivine
(B) Pyroxene
(C) Quartz
(D) Mica
42. What is the chemical formula of Calcite ?
(A) CaSO_4 (B) CaCO_3
(C) CaCl_2 (D) CaF_2
43. Which dating method uses the decay of Potassium-40 to Argon-40 to date ancient rocks ?
(A) Fission track dating
(B) Uranium-lead dating
(C) Potassium-argon dating
(D) None of the above
44. Isostasy refers to
(A) Earthquake occurrence
(B) Volcanic eruption frequency
(C) Equilibrium between Earth's crust and mantle
(D) Ocean floor spreading
45. What is the primary component of sedimentary rock sandstone ?
(A) Silica
(B) Clay
(C) Calcium carbonate
(D) Iron oxide
46. Which type of metamorphism is associated with regional tectonic forces ?
(A) Contact metamorphism
(B) Regional metamorphism
(C) Burial metamorphism
(D) Hydrothermal metamorphism
47. What is the classification of ore deposits based on their genesis ?
(A) Sedimentary and Igneous
(B) Primary and Secondary
(C) Intrusive and Extrusive
(D) Magmatic, Metamorphic and Sedimentary
48. Which of the following is the most important radioactive mineral found in India ?
(A) Potassium
(B) Uranium
(C) Radium
(D) None of the above
49. The principle that states "The older layers are at the bottom and the younger layers are at the top" is known as
(A) Principle of superposition
(B) Principle of lateral continuity
(C) Principle of uniformitarianism
(D) Principle of faunal succession



50. What is the standard stratigraphic scale used for ?

- (A) Measuring seismic activity
- (B) Classifying different species of fossils
- (C) Providing a relative dating system for rocks
- (D) Calculating the size of mountain ranges

51. The breaking down of rocks by physical or chemical means is called

- (A) Weathering
- (B) Diagenesis
- (C) Deposition
- (D) None of the above

52. The Siwalik Hills are an example of which type of geomorphic feature ?

- (A) Plateau
- (B) Fold Mountain
- (C) Dome
- (D) Fault Block

53. In optical mineralogy, dispersion refers to

- (A) The separation of light into its component colors
- (B) The ability of minerals to bend light
- (C) The tendency of light to be absorbed by certain minerals
- (D) The scattering of light in all directions

54. The principal axes of the optic indicatrix in anisotropic minerals are

- (A) Parallel to the crystallographic axes
- (B) Perpendicular to the crystallographic axes
- (C) Randomly oriented within the crystal
- (D) Identical in all crystals

55. Which type of fossil preservation involves the replacement of organic material by minerals like silica or calcite ?

- (A) Permineralization
- (B) Carbonization
- (C) Mummification
- (D) Freezing

56. The evolutionary trend seen in gastropods is mainly related to

- (A) Increase in body size
- (B) Shell coiling direction
- (C) Loss of shell
- (D) Eye development

57. What is the average radius of the Earth ?

- (A) 6,371 km
- (B) 5,371 km
- (C) 7,371 km
- (D) 8,371 km



58. Which layer of the Earth is composed mainly of nickel and iron ?

- (A) Crust
- (B) Mantle
- (C) Inner Core
- (D) None of the above

59. Which of the following is true about Deccan basalts ?

- (A) They are primarily formed from sedimentary processes
- (B) They have a high content of silica
- (C) They are metamorphic in origin
- (D) They are the result of volcanic eruptions

60. What is the definition of an ore ?

- (A) A rock that contains only minerals
- (B) A mineral that is valuable for its aesthetic value
- (C) A mineral deposit from which metals can be extracted profitably
- (D) A rock containing only gangue minerals

61. The boundary between the



Cretaceous and Tertiary systems is marked by

- (A) A major extinction event
- (B) The end of the Permian period
- (C) The formation of new mountains
- (D) The breakup of Pangaea

62. The use of X-rays for crystal studies helps to determine



- (A) Crystal color
- (B) Crystal structure
- (C) Crystal hardness
- (D) None of the above

63. What structural feature distinguishes inosilicates from other silicates ?

- (A) Isolated tetrahedra
- (B) Rings of tetrahedra
- (C) Single or double chains of tetrahedra
- (D) Sheets of tetrahedra

64. What is Bowen's Reaction Series used to explain ?

- (A) The formation of sedimentary rocks
- (B) The crystallization sequence of minerals from magma
- (C) The process of metamorphism
- (D) The origin of the Earth's crust

65. Which of the following is considered an agent of geomorphic processes ?

- (A) Clouds (B) Earthquake
- (C) Moon (D) Wind

66. What type of drainage pattern develops on uniform rock structure ?



- (A) Trellis (B) Radial
- (C) Dendritic (D) Rectangular



67. Which soil type has the highest water retention capacity ?

- (A) Sandy soil
- (B) Silty soil
- (C) Clayey soil
- (D) Loamy soil

68. The concept of 'Strategic Minerals' includes

- (A) Only precious stones
- (B) Minerals used in everyday domestic utilities
- (C) Decorative minerals
- (D) Minerals critical for national security and defense



69. Which geological system represents the oldest rocks in the Indian subcontinent ?



- (A) Vindhyan System
- (B) Cenozoic System
- (C) Archean System
- (D) Deccan Traps

70. Which boundary problem is commonly encountered in stratigraphy ?



- (A) Disconformities
- (B) Nonconformities
- (C) Synclines
- (D) Unconformities

71. What is a common human activity that alters the environment ?

- (A) Earthquake
- (B) Volcanic eruption
- (C) Deforestation
- (D) Rainfall



72. Which one of the following is a man-induced geo-hazard ?

- (A) Earthquake
- (B) Volcano
- (C) Tsunami
- (D) Landslide due to deforestation

73. The interference colors in a mineral are caused by

- (A) Absorption of light
- (B) Dispersion of light
- (C) The interaction of light with the crystal lattice
- (D) The molecular composition of the mineral

74. The optic indicatrix in anisotropic minerals is

- (A) An elliptical surface
- (B) A spherical surface
- (C) A hyperbolic surface
- (D) A paraboloid surface

75. Siwalik vertebrate fossils mostly belong to which geological era ?

- (A) Paleozoic
- (B) Mesozoic
- (C) Precambrian
- (D) Cenozoic



76. Trilobites belong to which class of organisms ?
(A) Arthropoda
(B) Echinodermata
(C) Mollusca
(D) Annelida
77. Which scale is commonly used to measure the magnitude of earthquakes ?
(A) Beaufort scale
(B) Mohs scale
(C) Celsius scale
(D) Richter scale
78. Which of the following is a product of volcanic activity ?
(A) Limestone
(B) Basalt
(C) Sandstone
(D) Shale
79. Marine mineral resources are governed by
(A) Indian Mines Act
(B) Forest Conservation Act
(C) United Nations Convention on the Law of the Sea (UNCLOS)
(D) National Mineral Policy, 2008
80. What is the main focus of environmental geology ?
(A) Study of planets
(B) Study of fossils
(C) Mining only
(D) Interaction between geology and human activities
81. Isotropic minerals
(A) Have the same optical properties in all directions
(B) Have different optical properties in different directions
(C) Are always opaque
(D) None of the above
82. Anisotropic minerals
(A) Exhibit the same optical properties in all directions
(B) Exhibit different optical properties in different directions
(C) Do not show interference colors
(D) Are always transparent
83. The study of rock layers and their sequence is called
(A) Paleontology
(B) Stratigraphy
(C) Petrology
(D) Geochemistry
84. Which of the following is the main basis for stratigraphic classification ?
(A) Fossil content
(B) Mineral composition
(C) Chemical composition
(D) Magnetic properties
85. Which mechanism is responsible for folding in the Earth's crust ?
(A) Heat and pressure
(B) Differential erosion
(C) Gravitational pull
(D) Magnetic forces



86. In structural geology, the term 'dome' refers to
- (A) A syncline structure
 - (B) A large anticline with circular or elliptical shape
 - (C) A fault line
 - (D) A strike-slip fault
87. Which of the following rocks is classified as an igneous rock ?
- (A) Sandstone
 - (B) Limestone
 - (C) Shale
 - (D) Granite
88. Which of the following is a characteristic of basaltic magma ?
- (A) High viscosity
 - (B) Low viscosity
 - (C) Rich in silica
 - (D) Contains large crystals
89. Which of the following minerals commonly shows pleochroism under polarized light ?
- (A) Quartz
 - (B) Olivine
 - (C) Biotite
 - (D) Feldspar



90. Which mineral displays polysynthetic twinning commonly ?



- (A) Orthoclase
- (B) Plagioclase feldspar
- (C) Quartz
- (D) Muscovite

91. What is the significance of the recognition of unconformities in geological studies ?



- (A) It helps to determine the age of rocks
- (B) It helps to identify fault zones
- (C) It reveals the presence of oil and gas reserves
- (D) It indicates the past tectonic activity and geological history

92. The term 'stress' in structural geology is best described as

- (A) The force applied per unit area of a rock
- (B) The amount of strain a rock can withstand before deformation
- (C) The speed at which tectonic plates move
- (D) The temperature variations in the Earth's crust

93. What does the ACF diagram in metamorphic petrology represent ?

- (A) Temperature and pressure conditions
- (B) The process of diagenesis
- (C) The chemical composition of the rock
- (D) Mineral assemblages in metamorphic rocks



94. Which of the following textures is commonly found in basalt ?

- (A) Phaneritic
- (B) Pegmatitic
- (C) Aphanitic
- (D) None of the above

95. What is the primary difference between crystalline and non-crystalline substances ?



- (A) Crystals have a random atomic arrangement, while non-crystalline substances have a regular arrangement
- (B) Crystals have a regular atomic arrangement, while non-crystalline substances lack regularity
- (C) Crystals cannot be formed at high temperatures, while non-crystalline substances can
- (D) Non-crystalline substances have a fixed melting point, whereas crystals do not

96. The crystal irregularity known as "dislocation" refers to

- (A) The absence of crystal faces
- (B) The chemical impurity within a crystal
- (C) The formation of voids in the crystal structure
- (D) A defect in the crystal lattice due to misalignment

97. Which of the following is a common method used in geological prospecting ?



- (A) Remote sensing
- (B) Quarrying
- (C) Road construction
- (D) None of the above

98. In which type of geological investigation are aerial photographs primarily used ?

- (A) Mineral extraction
- (B) Subsurface water testing
- (C) Surface mapping
- (D) Tunneling

99. The Indian stratigraphic system is primarily divided into which three periods ?

- (A) Paleozoic, Mesozoic, Cenozoic
- (B) Precambrian, Cambrian, Ordovician
- (C) Jurassic, Cretaceous, Tertiary
- (D) Proterozoic, Paleozoic, Mesozoic

100. The main method of correlating rock layers across different regions is



- (A) Biostratigraphy
- (B) Lithostratigraphy
- (C) Chronostratigraphy
- (D) Magnetostratigraphy