

P.G. ENTRANCE EXAMINATION, APRIL 2021

APPLIED GEOLOGY

Time : Two Hours

Maximum : 100 Marks

I. Answer *all* questions :

- 1 The approximate percentage of oxygen, nitrogen, and carbon dioxide in pure air on the Earth's atmosphere :
 - a) 0.03%, 21% and 78%.
 - b) 78%, 21% and 0.03%.
 - c) 21%, 78% and 0.03%.
 - d) 21%, 7.8% and 0.03%.
- 2 The planet with the least density :
 - a) Saturn.
 - b) Mars.
 - c) Pluto.
 - d) Venus.
- 3 The Gutenberg discontinuity exists between :
 - a) Core and Mantle.
 - b) Inner and Outer core.
 - c) Crust and Mantle.
 - d) Upper mantle and lower mantle.
- 4 The thinnest crust of the Earth is at :
 - a) Shield areas.
 - b) Mountain belts.
 - c) Mid-oceanic ridges.
 - d) Ocean floor.
- 5 Chemical weathering is most possible in which of the following locations ?
 - a) Munnar.
 - b) Jaisalmer.
 - c) Ladakh.
 - d) Tirunelveli.
- 6 Which is a feature associated with rivers ?
 - a) Yardang.
 - b) Bergschrund.
 - c) Thalweg.
 - d) Serir.
- 7 The twin plane of the Manebach Law is :
 - a) (021).
 - b) (001).
 - c) (010).
 - d) (100).

Turn over

- 8 Which of the following is correctly arranged by hardness ?
- a) Corundum, topaz, orthoclase, quartz.
 - b) Fluorite, orthoclase, quartz, topaz.
 - c) Quartz, corundum, topaz, diamond.
 - d) Diamond, corundum, quartz, topaz.
- 9 Ruby and sapphire are gem names for the mineral :
- a) Opaz.
 - b) Beryl.
 - c) Garnet.
 - d) Corundum.
- 10 Miller indices for octahedral plane in cubic crystal :
- a) (100).
 - b) (110).
 - c) (111).
 - d) (001).
- 11 Repeatable entity of a crystal structure is known as :
- a) Crystal.
 - b) Unit cell.
 - c) Lattice.
 - d) Miller indices.
- 12 Which of the following is arranged in correct decreasing order of geological age ?
- a) Talchirs - Kurnools - Quilon beds - Siwaliks - Karewas.
 - b) Kurnools -Talchirs - Quilon beds - Siwaliks - Karewas.
 - c) Kurnools -Talchirs - Quilon beds - Karewas - Siwaliks.
 - d) Kurnools - Quilon beds - Talchirs - Siwaliks - Karewas.
- 13 The plant fossil Gangamopteris represents :
- a) Upper Gondwana.
 - b) Lower Gondwana.
 - c) Cretaceous.
 - d) Jurassic.
- 14 The northern part of the west coast of India is known as :
- a) Konkan coast.
 - b) Kannad plain.
 - c) Malabar coast.
 - d) Coromandel coast.

- 15 Toposheets of India are manufactured by which organization ?
- a) Geological Survey of India.
 - b) Surevy of India.
 - c) National Atlas and Thematic Mapping Organization.
 - d) National Remote Sensing Agency.
- 16 The youngest mountain chain is :
- a) Aravalli.
 - b) Himalaya.
 - c) Western Ghats.
 - d) Nilgiri.
- 17 Omphacite is associated with which rock ?
- a) Eclogite.
 - b) Marble.
 - c) Hornfels.
 - d) Dolerite.
- 18 The approximate temperature at which diagenesis ends and metamorphism starts (in oC) :
- a) 50.
 - b) 100.
 - c) 200.
 - d) 450.
- 19 Harry Hess discovered evidence continental drift, and named it :
- a) Ocean drift.
 - b) Plate tectonics.
 - c) Seafloor spreading.
 - d) Magnetic anomaly.
- 20 The fine grained equivalent of a granite is :
- a) Rhyolite.
 - b) Gabbro.
 - c) Andesite.
 - d) Basalt.
- 21 Compared to felsic magmas, mafic magmas are relatively enriched in :
- a) Calcium.
 - b) Iron.
 - c) Magnesium.
 - d) All of the above.
- 22 An unconformity separating strata that are parallel to each other :
- a) Disconformity.
 - b) Nonconformity.
 - c) Angular unconformity.
 - d) None of the above.

Turn over

23 Continental crust is higher in elevation than oceanic crust because :

- a) It is denser than oceanic crust.
- b) It is younger than oceanic crust.
- c) It is older than oceanic crust.
- d) It is more bouyant than oceanic crust.

24 Clay-sized material is less than :

- a) 1/256 mm in diameter.
- b) 1/256 to 1/16mm in diameter.
- c) 1/16 to 2 mm diameter.
- d) > 2 mm in diameter.

25 Sequence of minerals that develop in prograde metamorphism of calc-silicate rocks :

- a) Forsterite - Diopside - Talc - Tremolite.
- b) Talc - Tremolite - Forsterite - Diopside.
- c) Talc - Diopside - Forsterite - Tremolite.
- d) Diopside - Forsterite - Tremolite - Talc.

26 The P-wave shadow zone of the earth ranges from :

- a) 103° - 153°.
- b) 103° - 143°.
- c) 103° - 180°.
- d) 103° - 160°.

27 At divergent zones, earthquakes commonly occur :

- a) Between offset segments, where segments move in opposite directions.
- b) At the ridge itself, where magma rises to the surface.
- c) At the ridge itself, where normal faulting occurs.
- d) Earthquakes do not occur at divergent zones.

28 How many large plates form the outer shell of the earth ?

- a) 5.
- b) 8.
- c) 14.
- d) 7.

- 29 Which of the following describes a gabbro ?
- a) Fine-grained, dark-colored igneous rock poor in silica.
 - b) Coarse-grained, dark-colored igneous rock poor in silica.
 - c) Fine-grained, dark-colored igneous rock rich in silica.
 - d) Coarse-grained, dark-colored igneous rock rich in silica.
- 30 Structural geology deals with :
- a) Primary structures formed during magmatic processes.
 - b) Primary structures formed during sedimentary processes.
 - c) Structures formed due to rock deformation.
 - d) None of the above.
- 31 Which among the following does not match ?
- a) Nebular hypothesis - Immanuel Kant.
 - b) Planetesimal Hypothesis - Chamberlin.
 - c) Tidal Hypothesis - Harold Jeffrey.
 - d) Cloud Hypothesis - Urey.
- 32 Which boundary and time unit does not match ?
- a) Permian - Triassic - 25 Ma.
 - b) Cretaceous - Tertiary - 65 Ma.
 - c) Archaean - Proterozoic - 2500 Ma.
 - d) Cambrian - Proterozoic - 540 Ma.
- 33 CuS is :
- a) Malachite.
 - b) Azurite.
 - c) Cuprite.
 - d) Covellite.
- 34 Which of the following is the oldest ?
- a) Vaikom formation.
 - b) Warkalli formation.
 - c) Vembanad formation.
 - d) Quilon formation.

35 Tungsten-bearing mineral :

- a) Monazite.
- b) Siderite.
- c) Scheelite.
- d) Goethite.

36 The mineral in the Moh's scale that crystallises in cubic system :

- a) Corundum.
- b) Quartz.
- c) Topaz.
- d) Fluorite.

37 Which among the following is wrong ?

- a) A contour line must close on itself.
- b) Map distance between two adjacent contour lines may vary.
- c) Contour lines of same elevation can intersect each other.
- d) Every point along a contour line must have exactly the same elevation.

38 When hanging wall moves down relative to footwall, the fault is a ?

- a) Reverse fault.
- b) Strike-slip fault.
- c) Normal fault.
- d) None of the above.

39 Cephalopoda with complex suture :

- a) Ammonites.
- b) Nautilus.
- c) Ceratites.
- d) Goniatites.

40 Which of the following is extinct ?

- a) Pelecypoda.
- b) Echinoidea.
- c) Ammonoidea.
- d) Nautiloidea.

41 Brachiopod shells are made up of :

- a) Two equal but inequilateral valves.
- b) Two unequal but equilateral valves.
- c) Two equal and equilateral valves.
- d) None of the above.

- 42 The structure in which younger rocks are surrounded by older rocks :
- a) Outlier.
 - b) Window.
 - c) Inlier.
 - d) Klippe.
- 43 Which among the following minerals is not found in the beach placers of Kerala ?
- a) Rutile.
 - b) Leucoxene.
 - c) Sillimanite.
 - d) Cassiterite.
- 44 The characteristic mineral in charnockite :
- a) Quartz.
 - b) Feldspar.
 - c) Garnet.
 - d) Hypersthene.
- 45 Cheruppa, Eliyottimala, Kakkayam are locations known for :
- a) Building stones.
 - b) Banded Iron Formations.
 - c) Bauxite.
 - d) Gold.
- 46 Iceland is located on which type of plate boundary ?
- a) Divergent.
 - b) Convergent.
 - c) Transform fault.
 - d) Triple junction.
- 47 Manganese deposits in Central India are associated with :
- a) Khondalite.
 - b) Charnockite.
 - c) Greywacke.
 - d) Gondite.
- 48 Quartz is :
- a) Biaxial positive.
 - b) Uniaxial positive.
 - c) Uniaxial negative.
 - d) Biaxial negative.
- 49 Hydrothermal deposits formed at depth and close to the intrusive, at 300°C to 500°C are :
- a) Hypothermal deposits.
 - b) Mesothermal deposits.
 - c) Epithermal deposits.
 - d) Syngenetic deposits.

Turn over

50 Which is a good aquifer that can yield potable water among the following ?

- a) Clay.
- b) Shale.
- c) Weathered crystalline rock.
- d) Limestone.

(50 × 1 = 50 marks)

II. Answer *all* questions, each not exceeding 500 words :

- 1 Explain Bowen's Reaction Series with a sketch.
- 2 Draw and label the parts of a trilobite.
- 3 Describe chemical weathering with examples.
- 4 Describe the garnet family of minerals.
- 5 Describe the Cretaceous of Tiruchirapalli.

(5 × 10 = 50 marks)

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