2026

GEOLOGY

(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

Answer Question Nos. 1 to 8 by choosing the correct one from the four alternatives given A, B, C and D and rewrite.

1. The Himalayan mountain ranges were formed primarily by_____. 1

   (A) Volcanic eruption (B) Glacial erosion

   (C) Meteorite impacts (D) Collision of tectonic plates

2. Ventifact is an erosional feature of _____. 1

   (A) Wind erosion (B) Soil erosion

   (C) Stream erosion (D) Glacial erosion

3. The hardness of quartz is – 1

   (A) 6 (B) 5

   (C) 7 (D) 9

4. The refractive index of Canada Balsam is – 1

(A) 1.54 (B) 1.45

(C) 1.65 (D) 1.50

5. The study of fossil tracks, trails and footprints is known as – 1

(A) Palynology (B) Ichnology

(C) Paleoecology (D) Micropaleontology

6. The most favourable environment for the formation of fossil is_____. 1

(A) Terrestrial (B) Lacustrine

(C) Fluvial (D) Marine

7. Which of the following is the ore of aluminium? 1

(A) Heamatite (B) Galena

(C) Bauxite (D) Pyrite

8. Gypsum is an example of _____. 1

(A) Evaporation deposits (B) Magmatic deposits

(C) Sublimation deposits (D) Hydrothermal deposits

Question Nos. 9 and 10 are Assertion and Reason based questions. Two statement are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the codes (A), (B), (C) and (D) as given below.

9. Statement-I (A) : Oxygen present in the water in dissolved state oxidizes some minerals.

Statement-II (R): During weathering, the oxygen unites with the iron producing insoluble iron oxides which imparts red and yellow colours to soil. 1

(A) Both statement-I and II are true and statement-II is the correct explanation of statement-I.

(B) Both statement-I and II are true but statement-II is not relevant to statement-I.

(C) Both statement-I and II are false.

(D) statement-I is true but statement-II is false.

10. Statement-I (A) : Organisms having hard skeleton have a better chance of being converted into fossils.

Statement-II (R) : Marine organisms are generally fossilized rather than the terrestrial organisms. 1

(A) Both statement-I and II are true and statement-II is the correct explanation of statement-I.

(B) Both statement-I and II are true but statement-II is not relevant to statement-I.

(C) Both statement-I and II are false.

(D) Statement-I is true but Statement-II is false.

Answer Question Nos. 11 to 17 in one word or one sentence each.

11. Define Erosion. 1

12. The age of the earth as revealed by Radioactive method is_____. 1

13. What are the products of volcanoes? 1

14. Arrange the following minerals in ascending order of hardness :
Gypsum, Orthoclase, Apatite, Quartz 1

15. Give an example of mineral which gives Metallic Lustre. 1

16. Define gangue minerals. 1

17. What are simple ores? 1

Answer Question Nos. 18 to 27 in about 30 - 40 words each.

18. Earthquake waves are used for investigation of the internal structures of the earth. If eathquake doesn't occur, what type of methods can be addopted to find the same? 2

19. Draw the internal structures of the earth and label it. 2

20. Why rhomb of calcite is cut at 68° and then recemented by Canada Balsam in the construction of Nicol Prism? 2

21. In the normal class of Isometric System, all the crystallographic axes are denoted by the letter 'a', why? Give reason. 2

22. In tetragonal system, the vertical axis is either shorter or longer than two horizontal axes, why? 2

23. Draw a neat sketch of a petrological microscope and label it. 2

24. Define fossils. 2

25. Why are internal organs of gastropods twisted by 180° torsion? 2

26. Give reason why index fossils are used for correlation purposes. 2

27. Define ore mineral. 2

Answer Question Nos. 28 to 33 in about 40 - 50 words each.

28. Describe the physical properties of Calcite. 3

OR

Describe the physical properties of Gypsum.

29. Differentiate between Lamellibranchia and Brachiopoda shells. 3

OR

Differentiate between articulata and inarticulata of phylum Brachiopoda.

30. Describe the mode of occurrence of Gold deposits. 3

OR

Describe the mode of occurrence of Bauxite.

31. The tenor of Gold is 0.01% whereas in case of cheaper metal like iron, the tenor is much higher i.e., 50% or more, why? Give reason. 3

OR

In the investigation of chromite deposits of Manipur, one has to go to Ukhrul and Chandel Districts, why? Give reason.

32. Give reason why Gossan is used in the search of mineral prospecting. 3

OR

Why is the process of oxidation often associated with the formation of infiltration deposits?

33. Read the following statement and answer the following questions.

(a) Ligament of a pelecepoda is an elastic tissue on cardinal area attaching the two valves along the hinge line. Structurally, ligament may be of three types, alivincular consisting of a single coral-like strands, multivincular

consisting of a bundle of strands and perivincular which consists of a hemicylindrical bands. Ligament may be present in the anterior of the beak, posterior of the beak or on either side of the beak.

(i) What will happen if ligaments are totally absent in pelecepoda? 3

OR

(b) Very rarely and only under ideal conditions, the whole body of a plants or animals may be found to have been preserved. In such cases, even the most delicate and soft parts are left unaltered. The remains of the woolly mammoths discovered in Northern Siberia are most celebrated examples in which the respective animals have been preserved intact.

(i) Give reason why whole body fossil of only a few animals like mammoths in Northern Siberia can be found?

Answer Question Nos. 34 - 36 in about 150 - 200 words each.

34. Describe any one hypothesis for the origin of Earth. 5

OR

Describe the concept of plate tectonics.

35. Explain the symmetry elements of the Normal Class of Hexagonal system. 5

OR

Explain the physical properties of the following minerals :

(a) Colour (b) Streak (c) Lustre (d) Cleavage (e) Fracture

36. Describe the morphological characters of Gastropoda. 5

OR

Describe the morphological characters of Lamellibranchia.
