Total No. of Printed Pages—8

HS/XII/Sc/Gl/22

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GEOLOGY

(Theory)

Full Marks : 70

Time : 3 hours

The figures in the margin indicate full marks for the questions

General Instructions :

(i) Write all the answers in the Answer Script.

(ii) Attempt Part—A (Objective Questions) serially.

(iii) Attempt all parts of a question together at one place.

(PART : A—OBJECTIVE)

(*Marks* : 35)

1. Choose and write the correct answer of any *six* of the following : 1×6=6

(a) Decomposition is associated with

(i) physical weathering

(ii) chemical weathering

(iii) organic weathering

(b) Organisms that swim about in ocean water are said to be

(i) planktonic

(ii) nektonic

(iii) benthonic

(c) The Disang group is observed in the stratigraphy of

(i) Assam

(ii) Meghalaya

(iii) Spiti

(d) Galena is the ore of

(i) iron

(ii) lead

(iii) zinc

(e) Marine organic animals give rise to

(i) coal

(ii) water

(iii) petroleum

(f) Ore deposits formed at the same time as the enclosing rocks are said to be

(i) syngenetic

(ii) epigenetic

(iii) metamorphic

(g) Which of the following is an ore of aluminium?

(i) Bauxite

(ii) Hematite

(iii) Coal

(h) Diamond bearing conglomerates were reported in the

(i) Dharwar supergroup

(ii) Vindhyan supergroup

(iii) Paleozoic of Spiti

(i) Acid rain is associated with

(i) overground coal mining

(ii) underground coal mining

(iii) overground Pb-Zn mining

2. State whether the following statements are 'True' or 'False' (any *six*) : 1×6=6

(a) Dihing Group is younger than the Disang Group in Upper Assam.

(b) Ores from which several metals can be extracted are called complex ores.

(c) Sands range in size from 4 mm to 1/16 mm.

(d) Muds are argillaceous materials.

(e) Pallial line is seen in lamellibranchs.

(f) The brachiopods evolved earlier than the gastropods.

(g) Closepet granite is associated with the stratigraphy of Meghalaya.

(h) The hot residual fluid containing minerals after the main minerals have crystallized out is called hydrothermal fluid.

(i) To mitigate the effect of earthquakes, buildings are to be constructed on soil.

3. Fill in the blanks (any *six*) : 1×6=6

(a) Water bearing formations in the earth are called _____.

(b) Wavy features on the top of sedimentary layers are called _____.

(c) Rocks of Archean age over which all other rocks are laid down/formed later is called the _____.

(d) The 'angle of rest' for a safe hill slope should not exceed _____°.

(e) Lung diseases in miners are associated with _____ mining.

(f) _____ coal is with over 90% carbon.

(g) The ease with which water moves through a medium is called _____.

(h) Petroleum is of _____ origin.

(i) The Barail Group is followed immediately upwards by the _____ Group.

4. Express each of the following in *1* (one) word (any *five*) : 1×5=5

(a) Rocks where oil accumulates

(b) Lessening of the hazards of natural earth processes

(c) Level below which actual groundwater occurs and the pores completely saturated with water

(d) Place where organism, past or present, live

(e) Transformation of loose sediments into hard lithified rock

(f) Natural earth process that brings loss of life and property

(g) Useless minerals

5. Match *Column—A* with *Column—B* and write the corresponding numbers : 1×6=6

Column—A	*Column—B*
(a) Bed load	*(i)* Gondwana
(b) Glossopteris	*(ii)* Spiti
(c) Placer	*(iii)* Assam
(d) Otoceras	*(iv)* Deposition
(e) Landslides	*(v)* Wet soil
(f) Conglomerate	*(vi)* Mechanical concentration
	(vii) Rudaceous
	(viii) Transportation

6. Write on the following in *1* (one) or *2* (two) line(s) (any *six*) : 1×6=6

(a) Dorsal side

(b) Mud crack

(c) Non-clastic sediments

(d) Ore

(e) Mould

(f) Vertebraria

(g) Nodule

(h) Definition of groundwater

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

Answer **five** questions, selecting **one** from each Group

GROUP—A

(Sedimentology)

7. Write a brief note on the common sedimentary structures with neat sketches. 7

8. Write on any *two* of the following : 3½×2=7

(a) Diagenesis

(b) Grain size and the size scale

(c) Clastic and non-clastic sedimentary rocks

9. Give a classification of the environments of deposition with very brief explanation on each of them. 7

GROUP—B

(Paleontology)

10. Outline the morphology of a typical brachiopod shell with suitable sketches. 7

11. Write on any *two* of the following : 3½×2=7

(a) Index fossil

(b) Fossils and correlation

(c) Suture and types of suture in cephalopods

12. Write a note on the coiling of gastropods and the different coiling patterns observed in gastropods. 7

GROUP—C

(Stratigraphy)

13. Write the lithostratigraphy of Meghalaya in tabular form with very brief petrographic note of each unit. 7

14. Write on any *two* of the following : 3½×2=7

(a) Barail group

(b) Correlation

(c) Intrusives into the Dharwar Supergroup

15. Write a petrographic description of the Lower Triassic rocks of Spiti. 7

GROUP—D

(Mineral and Energy Resources)

16. Outline the formation of coal. 7

17. Write on any *two* of the following : 3½×2=7

(a) Classification of magmatic ore deposits

(b) Lead deposits in India

(c) Distribution of radioactive minerals in India

18. Write an account on the origin and distribution of chromite in India. 7

GROUP—E

(Engineering Geology, Groundwater, Environment and Disaster Studies)

19. Write on the various causes of landslides. 7

20. Write on any *two* of the following : 3½×2=7

(a) Environmental impact of open-cast mining

(b) Porosity and permeability

(c) Mitigation of earthquakes

21. Explain how sedimentary rock structures have an influence on dam stability with sketches. 7

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