

Total No. of Printed Pages—8

HS/XII/Sc/G1/25

2 0 2 5

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) Sedimentary rocks are
- (i) primary rocks
 - (ii) secondary rocks
 - (iii) Both (i) and (ii)
 - (iv) None of the above

(2)

- (b) Disintegration is associated with
- (i) physical weathering
 - (ii) chemical weathering
 - (iii) organic weathering
- (c) Rain-prints are formed on the top surface of loose sediments due to
- (i) the effect of solar heat
 - (ii) movement of organisms on the surface of loose and soft sediments
 - (iii) impacts of drops of rainwater
- (d) Brachiopods are characterised by the presence of a test made up of
- (i) two equal valves
 - (ii) two unequal valves
 - (iii) one valve
- (e) The bottommost beds of the Jaintia series is known as
- (i) Kopili stage
 - (ii) Sylhet stage
 - (iii) Therria stage

(3)

(f) Deposits of clay, silts and alluvial materials are often utilised for the construction of

(i) earth dams

(ii) masonry dams

(iii) cofferdams

(g) Bauxite is an ore of

(i) iron

(ii) zinc

(iii) aluminium

(h) Organisms capable of swimming against a current are said to be

(i) planktonic

(ii) nektonic

(iii) benthonic

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

(a) The rocks of sedimentary origin occur essentially in the form of layers/beds.

(b) Index fossils are not useful in establishing the correct age of the rock beds in which they occur.

(c) Lamellibranchs with two adductor muscles are known as Monomyaria.

(d) Gastropods exhibit dextral coiling of the shell.

(e) A number of individual beds of more or less similar characteristics together constitute a formation.

(4)

(f) Magmatic concentration includes dissemination, segregation and injection.

(g) Acid rain can contaminate lakes and streams.

(h) Rains promote landslide.

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

(a) The remains of plants and animals preserved by nature within the rocks are known as _____.

(b) _____ are very often developed due to drying under sub-aerial conditions in fine grained sediments.

(c) The teeth and sockets together form the _____.

(d) Earthquake waves are also called _____.

(e) Coal is a _____ deposit.

(f) Coal of North-East India is of _____ tertiary coal.

(g) Galena is an ore of _____.

(h) The Jaintia Group is overlain by the _____ group.

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

(a) The process of formation of mineral deposits due to invasion of magmatic emanations into the country rocks

(b) Water that is present beneath the earth's surface in rock and soil pore-spaces and in the fractures of rock formations

(5)

- (c) A violent and abrupt shaking of the ground
- (d) An ore of copper
- (e) Rocks that essentially occur in the form of layers or beds
- (f) Undulations produced on the surface of sediments

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

<i>Column—A</i>	<i>Column—B</i>
(a) Tremors	(i) Anthracite
(b) Brown coal	(ii) Tenor
(c) Iron	(iii) Bauxite
(d) Metal content of an ore	(iv) Lamination
(e) Supergene enrichment	(v) Earthquake
(f) Thin layers	(vi) Foliation
	(vii) Hematite
	(viii) Lignite
	(ix) Exogenetic process

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

- (a) Current bedding
- (b) Conditions favourable for preservation of fossils
- (c) Index fossils

(6)

- (d) Correlation
- (e) Dentition
- (f) Uses of mica
- (g) Permeability
- (h) Open-cast mining

(PART : B—DESCRIPTIVE)

(Marks : 35)

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

GROUP—A

(**Sedimentology**)

7. Explain how disintegration differs from decomposition. What are rudaceous rocks? Describe how lithification of rocks takes place. 2+2+3=7
8. Write short notes on any *two* of the following : 3½×2=7
- (a) Nodules and concretions
 - (b) Mechanical structures of sedimentary rocks
 - (c) Non-clastic rocks
9. Describe the textures of sedimentary rocks on the basis of grain size and; roundness and sorting. 7

(7)

GROUP—B

(**Paleontology**)

10. Outline the morphology of a typical gastropod shell with a neat labelled sketch. 6+1=7
11. Write short notes on any *two* of the following : 3½×2=7
- (a) Types of suture in cephalopods
- (b) Glossopteris
- (c) Morphology of a brachiopod
12. Define a fossil. Explain briefly the different modes of preservation of fossils. 1+6=7

GROUP—C

(**Stratigraphy**)

13. Outline the lithostratigraphy of Paleozoic of Spiti in tabular form. 7
14. Write short notes on any *two* of the following : 3½×2=7
- (a) Upper Vindhyan
- (b) Tipam Group
- (c) Jaintia Group
15. Write briefly on the Precambrian of Dharwar Supergroup of Karnataka. 7

(8)

GROUP—D

(Energy and Mineral Resources)

16. Explain the formation of economic minerals by magmatic processes. 7
17. Write short notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
- (a) Mode of occurrence of petroleum
 - (b) Distribution of radioactive minerals in India
 - (c) Types of coal
18. Give an account on the origin and distribution of bauxite in India. 7

GROUP—E

(Engineering Geology, Groundwater, Environment and Disaster Studies)

19. Describe the geological considerations required for the construction of dams. 7
20. Write short notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
- (a) Aquifer
 - (b) Mitigation of landslides
 - (c) Effects of earthquake
21. What is open-cast mining? Describe the impact of open-cast mining on the environment. $1+6=7$
