

2 0 1 9

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 the following : 1×6=6

(a) Pick the odd one out.

- (i) Beds
- (ii) Ripples
- (iii) Cross-beds
- (iv) Borings

(2)

(b) The hinge area of lamellibranches posterior to the beak is called the

(i) cardinal area

(ii) lunule

(iii) escutcheon

(iv) adductor impression

(c) Nummulite is a fossil from

(i) Meghalaya

(ii) Spiti

(iii) Sone valley

(iv) Dharwar

(d) Ore deposits formed later than the enclosing rock are said to be

(i) syngenetic

(ii) epigenetic

(iii) magmatic

(iv) secondary

(3)

- (e) A good dam site is where the
- (i) river valley is narrow and rocks dip downstream
 - (ii) river valley is narrow and rocks dip upstream
 - (iii) river valley is wide and rocks dip downstream
 - (iv) river valley is wide and rocks dip upstream
- (f) Diamond-bearing conglomerate is associated with the
- (i) Dharwar supergroup
 - (ii) Vindhyan supergroup
 - (iii) Paleozoic rocks of spiti
 - (iv) Cretaceous rocks of Meghalaya

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

- (a) Sands range in size from 1/16 mm – 1 mm.
- (b) Each of the individual coils of a gastropod shell is called the body whorl.
- (c) Alternate sandstones and limestones are found in the Jaintia group.
- (d) Folds, faults and unconformities act as petroleum traps.
- (e) A highly porous rock indicates also a highly permeable rock.
- (f) Monazite is an ore of bauxite.

(4)

3. Fill in the blanks :

1×6=6

- (a) The _____ environment of deposition lies between the low-tide and high-tide mark.
- (b) $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ is the ore of _____.
- (c) The simplest type of suture in cephalopods is the _____ type of suture.
- (d) The Middle and Upper Dharwars are of _____ origin.
- (e) The angle of repose of rocks is _____, and greater than this induces landslides.
- (f) An example of a non-clastic rock is _____.

4. Express each of the following sentences in 1 (one) word :

1×5=5

- (a) Conversion of loose sediments into hard rocks
- (b) Conversion of plants and animals into rock
- (c) The correspondence or relationship of rocks of one area with that of another area
- (d) Mineral from which one or more metals can be extracted
- (e) The case with which water or fluids move through a rock or soil

(5)

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

<i>Column—A</i>	<i>Column—B</i>
(a) Fluvial	(i) Index fossil
(b) Coal	(ii) Gastropod, cephalopod
(c) Correlation	(iii) Supergene enrichment
(d) Bivalves	(iv) River
(e) Sulfides	(v) Magmatic
(f) Subsidence	(vi) Beach
	(vii) Swamp
	(viii) Brachiopod, lamellibranch
	(ix) Mining

6. Write 1 (one) or 2 (two) line(s) on the following : $1 \times 6 = 6$

- (a) Diagenesis
- (b) Habitat of organisms
- (c) Landslide
- (d) Suture
- (e) Ores of iron
- (f) Bed

(6)

(PART : B—DESCRIPTIVE)

(Marks : 35)

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

GROUP—A

(**Sedimentology**)

- 7.** List the textural parameters of sedimentary rocks.
Explain any two of them. 1+(3+3)=7
- 8.** Write notes on any *two* of the following : $3\frac{1}{2} \times 2 = 7$
- (a) Clastic sedimentary rocks
 - (b) Modes of sediment transport
 - (c) Classification of the environments of deposition

GROUP—B

(**Paleontology**)

- 9.** Outline the morphology of a typical gastropod shell.
Draw a neat labelled sketch. 6+1=7
- 10.** Write notes on any *two* of the following : $3\frac{1}{2} \times 2 = 7$
- (a) Glossopteris and gangamopteris flora
 - (b) Importance of fossils in paleogeography
 - (c) Common modes of preservation of fossils

(7)

GROUP—C

(**Stratigraphy**)

- 11.** Write the tertiary stratigraphy of Upper Assam in tabular form. Add brief petrographic notes of the rock units. 4+3=7
- 12.** Write notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
- (a) Jaintia group
 - (b) Correlation
 - (c) Permo-Carboniferous rocks of spiti

GROUP—D

(**Mineral and Energy Resources**)

- 13.** Outline the sedimentary processes of formation of mineral deposits. 7
- 14.** Write notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
- (a) Distribution of chromite in India
 - (b) Migration and accumulation of petroleum
 - (c) Early magmatic deposits

(8)

GROUP—E

**(Engineering Geology, Groundwater, Environment
and Disaster Studies)**

- 15.** Write a note on the occurrence of groundwater. What are aquifers? Explain the types of aquifer. $3+1+3=7$
- 16.** Write notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
- (a) The required geologic conditions that lead to success of dams and associated reservoirs
 - (b) Porosity and permeability
 - (c) Water and degree of slope as factors leading to landslides

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