HS/XI/Sc/Gl/18

2018

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 : 1 x 5 = 5

(a). An example of depositional landform associated with running water is

(i) gorge

(ii) canyon

(iii) waterfall

(iv) delta

(b) If the atomic structure of a mineral is identical in all directions, then the mineral is

(i) isotropic

(ii) shows high birefringence

(iii) exhibits twinning

(iv) shows double refraction

(c) By joining the successive hinges in a sequence of folded layers, we determine the

(i) hinges

(ii) fold axis

(iii) axial surface

(iv) median surface

(d) The point at which two minerals simultaneously crystallize from a melt is called

(i) melting point

(ii) freezing point

(iii) labile stage

(iv) eutectic

(e) Alignment of platy or flaky minerals in parallel layers give rise to the metamorphic rock

(i) slate

(ii) schist

(iii) gneiss

(iv) hornfels

2. State 'True' or 'False' : 1 x 5 = 5

(a) Earthquakes are recorded by seismograms.

(b) Minerals break along smooth parallel surfaces called fractures.

(c) Crust and uppermost mantle make up tectonic plates.

(d) It is possible to give rise to diverse rocks from one single parental magma.

(e) The presence of muscovite and biotite indicates high metamorphic grade.

3. Fill in the blanks : 1 x 10 = 10

(a) When sediments are laid down as layers, they are deposited in a _____ manner.

(b) The change in color of a mineral under polarized light is called _____.

(c) The clinographic relationship $a_1 = a_2 = a_3 \neq c$ is related to the _____ system.

(d) _____ are the finest products of a volcano.

(e) Tabular igneous rocks parallel to bedding are called _____.

(f) Generally, the last mineral to crystallize from an igneous melt is _____.

(g) Strike of rocks is perpendicular to _____.

(h) An example of low grade metamorphic rock is _____.

(i) The term _____ is used to denote metamorphic rock fabric.

(j) Folds with almost horizontal axial surface are called _____ folds.

4. Express in one word : 1 x 3 = 3

(a) Hot igneous melt on the earth's surface.

(b) Crystals joined along common crystallographic planes.

(c) Physical and chemical breakdown of rocks.

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

Column A	Column B
(a) Denudation	*(i)* inclination of line
(b) Plunge	*(ii)* gravity settling
	(iii) cataclasis
(c) Differentiation	*(iv)* small crystals
	(v) erosion
(d) Stress	*(vi)* large crystals
(e) Palimpsest	*(vii)* inclination of plane
	(viii) weathering and erosion
(f) Phenocrysts	*(ix)* remnant fabric.

6. Write briefly within three sentences on: 1 x 6 = 6

(a) Agents of weathering

(b) Plane of symmetry

(c) Plastic deformation

(d) Concept of crystallization

(e) Concept of metamorphism

(f) Batholith

(PART : B–DESCRIPTIVE)

(*Marks :* 35)

Answer five questions selecting one from each Group

GROUP – A

(General Geology)

1. Elucidate the nature of the earth's interior. Draw a neat sketch. 7

2. Answer *any two* of the following : 3½ x 2 = 7

(a) Processess of weathering

(b) Geological Time Scale

(c) Origin of the solar system

GROUP – B

(Crystallography and Mineralogy)

3. List the symmetry elements of the Normal Class of the Tetragonal system. List the forms developed in the Normal Class of the Tetragonal system. Distinguish a Tetragonal prism from a pyramid. Draw a clinographic sketch of the Tetragonal system. Name two minerals crystallizing in the Tetragonal system.

1½ + 2 + 2 + ½ + 1 = 7

4. Answer *any two* of the following: 3½ x 2 = 7

   (a) Polarization of light

   (b) Double refraction

   (c) Common physical properties of minerals.

GROUP – C

(Structural Geology and Geotectonics)

5. Define a fault. What is footwall and hanging wall and slip of faults? Write brief notes on the various types of faults with sketches. 1 + 2 + 4 = 7

6. Answer any *two* of the following: 3½ x 2 = 7

   (a) Anticline and syncline

   (b) Joints

   (c) Concept of plate tectonics.

GROUP – D

(Igneous Petrology)

7. Write notes on any seven common textures seen in volcanic and plutonic igneous rocks. Draw suitable diagrams. 7

8. Answer any *two* of the following: 3½ x 2 = 7

   (a) Concept of metamorphic differentiation

   (b) Magma

   (c) Assimilation

GROUP – E

(Metamorphic Petrology)

9. Write short notes on any three metamorphic rock textures and any three metamorphic rock structures. Draw neat diagrams. 6 + 1 = 7

10. Answer any *two* of the following: 3½ x 2 = 7

    (a) Agents of metamorphism

    (b) Regional metamorphism

    (c) Riecke's Principle.

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