IAS Mains Geology 2005

Paper II

Section A

1. Answer any THREE of the following in about 200 words each: (20 × 3 = 60)

    a. Answer below questions

        i. Explain differences in the elements of symmetry of Holohedral classes of the Tetragonal and Orthorhombk systems

        ii. Draw qualitative Laue diffractograms taken with X-ray beam parallel to c-axis of a tetragonal and an orthorhombic mineral.

    b. If a melt in the Albite-Anorthite system has composition An 40, describe its crystallization path when crystals maintain perfect equilibrium with melt.

    c. Answer below questions

        i. If Calcite-Wollastonite-Forsterite assemblage occurs at the contact between a gabbro and a marble, name and describe two assemblages progressively away from the contact.

        ii. What are pressure shadows and how are they formed?

    d. Describe significant structures of sediments deposited within deltaic environment.

2. What do you understand by terms like calcic pyroxenes, Mg-Fe pyroxenes, and sodic pyroxenes? Name one mineral in each category, giving its physical and optical properties (60).

3. Write explanatory notes on the following:

    i. Anorthosite in the Precambrian Shield of the Indian Peninsula (30)

    ii. Prehnite-Pumpellyite metamorphic fades (30)

4. How does physical weathering differ from chemical weathering? What common sedimentary minerals are formed from all the chemicals released by the weathering of feldspars, and how (60)

Section B

5. Write notes on any THREE of the following in about 200 words each: (20 × 3 = 60)

    a. Salient features of stock work and massive sulphide deposits

    b. Indian manganese deposits

    c. Reflection and refraction seismic methods of ore body location

    d. Soil erosion as a threat to environment and crop production.

6. Give an account of the Precambrian Iron Formation including their worldwide distribution and classification (60).

7. What is understood by Airborne Magnetic Survey? With the help of suitable diagrams, describe its utility as a suitable geophysical exploration method (60).

8. Describe how floods in a given region are related, as a geologic phenomenon, to precipitation, soil characteristics, vegetation and season: (60)