Junior Research Fellowship in Geology

Test Code: RG (Short answer + Objective type) 2010

The candidates for Junior Research Fellowship in Geology will have to take two tests- Test GM in the forenoon session and Test RG in the afternoon session.

Syllabus

1. *Structural Geology*
   Concepts of stress and strain, plastic and viscous flow; theory of brittle fracture. Folding and faulting – their classification and mechanics. Superposed folds and their recognition. Classification and genesis of foliation, lineation and joints. Outline of the structure of the Himalayas. Isostasy and gravity anomalies.

   Plate tectonics and mobile belts, seismisity and seismic zones. Interpretation of geological maps.

2. *Mineralogy*
   General principles of mineral optics and modern methods of mineral identification.

3. *Petrology*
   Phase equilibria studies of various silicate systems with reference to petrogenesis. Concept of magma; magmatic differentiation and assimilation.
   Petrogenetic study of important igneous or groups of igneous rocks – granites, alkaline rocks, andesite, basalt, ophiolites. Processes of generation of magmas in the crust and upper mantle – correlation with plate tectonics.
   Controls of metamorphism, nature of metamorphic reactions, chemical equilibrium. Metamorphic facies concept : Mineral assembalges and important reactions in different metamorphic facies. Relationship between metamorphism, ultrametamorphism and granitization. Petrogenetic problems of Khondalite, Charnockite and other metamorphic rocks of India.

4. *Geochemistry*
   Radioactivity : Radioactive decay, age and event dating, nuclear clocks. Geochemical classification and distribution of elements in the earth. Law of ionic substitution, concept of solid solution and controlling factors.

5. *Sedimentology*
   Classification of sedimentary rocks. Transport of sediments by fluids. Texture of sedimentary rocks. Sedimentary structures. Environments of deposition and resulting succession of sedimentary structures and lithologies. Processes and products of continental, transitional to marine and marine depositional environments. sedimentary facies analysis. Lithification and diagenesis of sediments. Statistical analysis of grain size and shape. Palaeocurrents and basin analysis. Major controls of sedimentation.