PART I

ENGINEERING GEOLOGY

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Introduction

Geology is a science dealing with study of Earth as a whole. In fact the word geology is of Greek origin meaning: Geo- Earth and Logos – science. It deals with the forces of nature and how they combine to produce the features visible on the earth's surface as well as those beneath the ground. It can be said that geology is dynamic because it involves physical changes in the earth as well. The aim of geology includes development of an understanding of earth materials and how these materials are changed and modified through action of natural forces over period of time.

The greatest emphasis in geology is on the study of materials that exist at present and the process which has operated to establish a record of the past event in the history of Earth. Geology is one of the important basic sciences and the subject is very vast. Important established branches of geology are:

Historical Geology

Dealing with past history of earth. How different type of forces have gradually changed constituents of earth with ages.

Physical Geology

This branch of geology deals with origin, development and various surface features of the earth and its structures.

Geomorphology

The branch deals with study of surface features of the earth mainly of land surface.

Mineralogy

It is a branch of geology which deals with formation, occurrence, properties and uses of minerals which are basic building units of which crust of earth is made of such as rocks and soils.

Petrology

The branch deals with the nature of geographic distribution of rocks on the surface and reasons governing such distribution.

Economic Geology

The branch of geology dealing with study of those minerals, rocks and material in the earth which can be and are exploited for benefit of mankind.

Engineering Geology

It is a field of applied science in which geological science is used in Civil Engineering practices. It deals with geological study of the site and location for

major engineering projects and availability of materials of required quantity for construction of a particular project.

Engineering geology plays a vital role in design and construction of safe and economical engineering projects. When a Civil engineer understands geology he can work in hand with geologist in site selection for dams, reservoirs, tunnels, highways, airport docks and harbours etc.

Where ever heavy load is expected through a structure, foundation has to be supported on strata which are sound enough to take the load coming through superstructures. In most of the cases a rock strata consists of several defects and discontinuity and how these can be made suitable for the foundation of the structure using suitable grouting and other suitable methods, comes in the preview of engineering geology.

Keeping in view of above facts it is essential for a Civil Engineer to have a good knowledge of geology so that he can look for safe and economical contraction of engineering projects.

In subsequent chapter, topics have been dealt which have been prescribed in the syllabus of Engineering Geology being following by most of the Indian Universities and prescribed in the syllabus of All India Council of Technical Education as well.