Shantilal Shah Engineering College, Bhavnagar

Date: 01 – 09 - 2018

Applied Mechanics Department

Active Learning Assignment for the subject of Geotechnics & Applied Geology [2130606] for 3RD Semester Students of Civil Engineering Students

Roll No.	Topic Name
1001-1010	**Introduction:** Definition, brief history, scope, and limitations of Geotechnics.
1011-1020	**Origin and Nature of Soil:** Geological cycle, Physical and chemical agencies for soil, Formation - residual, transported, alluvial, marine and lacustrine, glacial drift, loess and colluvial soils. General characteristics of different types of soils. Overview of different types of soils in Gujarat / India.
1021-1030	**Index Properties, Relationships and Tests:** Phase diagram, Basic terms and definitions, Functional relationships, Determination of index properties, Relative density for granular soil.
1031-1040	**Particle Size Analysis:** Size and nomenclature of soil particles as per IS, Sieve analysis, Sedimentation analysis, Particle size distribution curve and its uses.
1041-1050	**Soil Structure:** Shape of the particles, Texture and structure of the soil. Types of the structure, properties, conditions for the formation of different structures.
1051-1060	**Soil Consistency:** Consistency limits and its determination, different indices, Field moisture equivalent, Activity, Sensitivity & Thixotropy of soil.
1061-1070	**Soil Classification:** Objectives, Basis, Textural, Unified soil classification, IS classification method, group index. Field identification and General characteristics of the soil.
1071-1080	**Soil Water:** Free water and held water, Structural water and absorbed water, Capillary
1081-1090	**Permeability and Seepage:** Darcy's law and its validity, Factors affecting permeability, Laboratory permeability tests, Introduction to field permeability test, Permeability of stratified soil masses, Laplace equation (2-D), Seepage pressure, Quick condition, Flow net, its characteristics and application.
1091-1100	**Physical Geology:** Branches and scope of Geology; Surface processes and landforms: **Weathering** and **Erosion;** Introduction to **geological agents** (river, wind, oceans, glaciers, groundwater) and their actions (erosion, transport and deposition). **Interior of the Earth:** internal structure of earth, study of core, mental and crust of the Earth. Processes responsible for **volcanism** (Process of volcanic eruption, types of volcanoes and volcanic hazard) and **earthquake** (Causes of earthquake occurrence, Distribution (seismic zoning), Seismo-tectonic setup of India, seismic hazard: Tsunamis, Active fault rupture, liquefaction).
1101-1110	**Physical Geology:** **Plate Tectonics:** Introduction to the concept of plate tectonics, mechanism responsible for plate movement, types of plate boundaries, processes and features associated with plate boundaries. Continental drift and sea floor spreading.

1111-1020	**Mineralogy and Petrology:** **Physical properties of minerals,** major rock forming minerals, occurrence and use of minerals. Introduction to major **rock types** (Igneous, sedimentary and metamorphic rocks); their **genesis, classification** and **structures; engineering properties of rocks,** advantages and disadvantages of different rock types at constructions sites.
1121-1130	**Geological time-scale and laws of stratigraphy:** Introduction to geological time scale and stratigraphy, Laws of stratigraphy.
1131-1140	**Structural geology:** Introduction to **primary** and **secondary** geological structures. Study of geological **faults, folds, joints** and **active faulting.** Their origin, types and engineering consideration. **Geological mapping:** study of Strike and dip using models and numerical problems, preparation of geological cross section.
1141-1145	**Hydrogeology:** Hydrological cycle and groundwater occurrence.

Note:

1. **All students of Group will have to submit the Power Point Presentation (PPT) of their GROUP on *10-09-2018* to Prof. K. A. Mehta (Room No. - 131, Main Building)**
2. **All Students will have to prepare the power - point presentation/slides, which is includes animations, pictures, and graphics of concern topic.**
3. **All Students should mention all details like Name of College with LOGO, Name of Students along with Enrollment Number, Group Number and Department in very Frist Slide of PPT.**

Prof. K. A. Mehta