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**B TECH**  
**(SEM-VII) THEORY EXAMINATION 2020-21**  
**GEOLOGY AND SOIL MECHANICS**

**Time: 3 Hours**

**Total Marks: 70**

**Note: 1. Attempt all Sections. If require any missing data; then choose suitably.**

**SECTION A**

**1. Attempt all questions in brief. 2 x 7 = 14**

a.	Write the difference between petrology and geology.
b.	Explain dip and strike with neat and clean diagram.
c.	Define the terms true dip and apparent dip.
d.	Define metamorphism.
e.	Outline any four engineering properties of rock as engineering material.
f.	Draw simple cross-section diagrams of the clay minerals kaolinite and illite.
g.	Explain porosity, degree of saturation and void ratio of soil.

**SECTION B**

**2. Attempt any three of the following: 7 x 3 = 21**

a.	Define mineral. Explain the detailed study of all rock forming minerals.
b.	What are folds? Describe various types of folds.
c.	Define earthquakes and tsunamis. Give a detailed description of tectonic earthquake.
d.	Give a detailed account of geological investigations of dams and reservoirs.
e.	A partially saturated soil from an earth fill has a natural water content of 19% and bulk unit weight of 19.33kN/m <sup>3</sup> . Assuming the specific gravity of soil as 2.6, calculate the degree of saturation and void ratio. If subsequently the soil is saturated, determine the dry and saturated unit weight.

**SECTION C**

**3. Attempt any one part of the following: 7 x 1 = 7**

(a)	Describe the internal structure of earth as revealed by seismological evidence.
(b)	Discuss the formation of rocks. Explain the uses & properties of rocks.

**4. Attempt any one part of the following: 7 x 1 = 7**

(a)	Distinguish between joints and faults.
(b)	Differentiate between stratification and lamination with a neat sketch. Also, explain the phenomena involved in cross bedding.

**5. Attempt any one part of the following: 7 x 1 = 7**

(a)	What are landslides? Describe their types, causes and preventive measures.
(b)	Write notes on Seismic zones in India. What geological consideration are taken for construction of building in these zones?

**6. Attempt any one part of the following: 7 x 1 = 7**

(a)	What do you mean by geo-physical exploration? Briefly describe its principles for sub-surface structures.
(b)	Write a note on ground water depletion in India.

**7. Attempt any one part of the following: 7 x 1 = 7**

(a)	Derive equation of normal stress by Boussineq assumptions for point load.
(b)	Differentiate critically the various earth pressure theories.