GEOGRAPHY

6TH SEMESTER (HONOURS)

PPAPER: DSE 4 (A) (HYDROLOGY) UNIT- 4.1

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- **Ground water:** Ground water that occurs below the surface of Earth, where it occupies all or part of the void spaces in soil or geologic strata. It is also called subsurface water.

- **Factor influencing ground water movement and storage:** The nature of subsurface materials strongly influences the rate of ground water movement and amount of water that can be stored. The factors are-

1) *Porosity*: one factor that influences how ground water move is the porosity of a soil. This is the amount of water the soil can hold. Porosity is the space between particles or percentage of the total volume of rock or sediment that consists of pore spaces. The size and shape of soil particles determine porosity. When particles are about same size and shape there tend to be larger open spaces since the particles don't fit together very well. Clay (50%) and sand( ) are both very porous materials for this reason. On the other hand, sediment like limestone (30%) is less porous because the particles fit together, closing up the pores. So more porous the sediment, the more water it can hold. The more water it can hold, the more water can move down into the ground.

2) *Permeability*: Permeability is the property of rock that measures the ability of a porous material to allow fluid to pass through it. Permeability tell us rate of water infiltration into the ground. If the material has high permeability than the connection of pore space allowing water to flow from one to another. However, if there is low permeability then the pore spaces are isolated and water is trapped within them. Example- In gravel all of the pore spaces well connected one another allowing water to flow through it, however in clay most of the pore spaces are blocked, meaning water cannot flow through it easily.

3) *Slope:*

The influence of slope will have a remarkable effect on the infiltration of surface water from the ground. A low slope percentage indicates that the surface water received mainly because of precipitation will have more time to remain on the ground surface and percolate into the subsurface. In case of highly sloping areas, the run-off is more immediate offering less retention time for the water on the ground surface and significantly reduces the groundwater recharge.

4) *Drainage Density:* Drainage in an area depends on the topography, slope and the subsurface characteristics. Drainage density is calculated as the total length of all the streams and rivers in a basin divided by the total area of the drainage basin. The higher the drainage density, the higher the run-off will be, and infiltration of water into the subsurface is affected.

5) *Land use:* Ground water is intimately connected with the landscape and land use pattern. Land use affects ground water resources through changes in recharge and by changing demands for water. Enlarged impervious area is the most important factor to decreased infiltration of ground water. The ground water storage is depleting due to impervious surface and extraction of more ground water to fulfill the demand of rapidly growth urbanization.

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