ADVANCED HYDROLOGY

3-0-0-0-9

Hydrologic cycle, systems concept, hydrologic model classification; Reynold's Transport Theorem, continuity, momentum, and energy equations; Atmospheric hydrology:atmospheric circulation, water vapor, formation and forms of precipitation, precipitable water, monsoon characteristics in India, Thunderstorm Cell model, IDF relationships; factors affecting evaporation, estimation and measurement of evaporation, energy balance method,aerodynamic method, Priestley Taylor method, and pan evaporation; Surface Water:Catchment storage concept, Hortonian and saturation overland flow, streamflowhydrographs,baseflow separation, index, ERH & DRH, algorithm for abstraction using Green Ampt equation, SCS method, overland and channel flow modeling, time area concepts, and stream networks; Unit Hydrograph: General hydrologic system model, response functions of a linearhydrologic systems and their interrelationships, convolution equation; definition and limitations of a UH; UH derivation from single and complex storms; UH optimization using regression, matrix, and LP methods; Synthetic unit hydrograph, SCurve, IUH; Subsurface Water: Soil moisture, porosity, saturated and unsaturated flow; Richards; equation,infiltration, Horton's, Philip's, and Green Ampt methods, parameter estimation, ponding timeconcepts; Groundwater Hydrology: Occurrence of groundwater, aquifers & their properties,Darcy's law, permeability, transmissibility, stratification, confined groundwater flow,unconfined groundwater flow under Dupit's assumptions; Well hydraulics, steady flow intoconfined and unconfined wells; Unsteady flow in a confined aquifer.