*Date – hours*

Written examination course “*Forest Hydrology” and*

*“Forest and Hillslope Hydrology*”

Student :

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***Problem 1***

*A mean annual discharge value of 0.6m3s-1 has been recorded at the outlet of a 20 km2 wide catchment. The annual total precipitation over the catchment is 1500 mm. Compute the evapotraspitation loss (in mm), assuming that the internal storage changes are negligible.*

*Results:*

*Evapotranspiration depth: mm*

***Problem 2***

*The mean annual precipitation over a 150 km2 wide catchment is 1300 mm. The potential evapotranspiration loss is 550mm whereas the real evapotranspiration loss is 300mm. Compute the mean annual runoff coefficient and the discharge values (m3/s), assuming that the internal storage changes are negligible.*

***Problem solution***

*Runoff coefficient:*

*Mean annual discharge: m3/s*

***Problem 3***

*Rainfall in a catchment 50 km2 wide is monitored by a network of 3 stations, for which the mean annual rainfall is:*

*Station 1: 2500 mm*

*Station 2: 1200 mm*

*Station 3: 950 mm.*

*Use the Thiessen method to compute the basin averaged mean annual rainfall. The Thiessen weights are as follows:*

*Station 1: 0.7*

*Station 2: 0.2*

*Station 3: 0.1.*

*For the same catchment, the real evapotranspiration amounts to 400 mm, whereas the potential evapotranspiration is 900mm. Compute the mean annual runoff coefficient, given that the variations in internal storages of the catchment are negligible. Compute also the mean annual discharge (m3/s) at the catchment outlet .*

*Results*

*Catchment averaged mean annual rainfall: mm*

*Runoff coefficient:*

*Mean annual discharge: m3/s*

***Problem 4***

*An artificial reservoir is fed by a 200 km2 wide catchment. During a flood event, the runoff to the reservoir during the ith hour was 10 mm. During the same hour, the volume of water in the artificial reservoir increased of 1.815 106 m3. Compute the mean discharge from the artificial reservoir during the ith hour, assuming that the losses due to evapotranspiration and internal storages are negligible (please, comment this assumption).*

*Results:*

*Mean discharge: m3/s*