6199-4-3P AID:97222 | 09/02/2020

Referring to the equation (4-3) from the chapter

S = P + Qin, + Iin - Qout - Iou t- R - E - T

Here

S represents the change in storage, P is  precipitation, Qin is Inflow,  Iin  is base flow, Qout is an outflow, Iou is infiltration or seepage, R is  runoff , E is evaporation & T is transpiration

Terms in above said formula is given in cm/s, converting them into m/year

i) Runoff(R)

Runoff (or) average outflow from the catchment is 34.2 m3 per second

Seconds per year are 31536000 s (i.e 365x24x60x60)

Runoff per year is 1078531200 m3 (i.e 34.2x31536000)

Area of Watershed is 4000 Km2

Depth of flow is (Volume inflow) / (Area)

Substitute volume as 107831200m3 and area as   4000 x 106m2

 ∴Depth of Runoff per year is 0.2696 m

ii) infiltration(Iou t)

Average infiltration rate    = 5.5 x 10-7 cm/s

Seconds per year are 31536000 s (i.e 365x24x60x60)

Total infiltration per year  = 5.5 x 10-7 x 31536000

∴ Depth of water that infiltered = 0.173448 m

iii) Evaporation (E)

 ∴ Total evaporation during year = 40 cm

  = 0.4 m/year

iv) Precipitation (P)

∴ Total precipitation depth during year = 1.02 m

Referring to the above-said equation (4-3) i.e S = P + Qin + Iin - Qou t- Iout - R - E - T

Substitute  P is 1.2 m (i.e 102cm), Qin is  0 m, Iin is 0, Qout is 0 m, Iou t is 0.173448, R is 0.2696 m,   E is 0.4 m, T is 0.

∴ Storage chage(S) = 1.2 + 0 + 0 - 0 - 0.173448 - 0.2696 - 0.40 - 0

      = 0.176952 m

Runoff coefficient is defined as the ratio of Runoff to precipitation.

Runoff coefficient=(Runoff)/( Precipitation)

Substitute Runoff as 0.2696 and Precipitation as 1.280

∴ Runoff coefficient is  0.2106