1. (20 pts) A lake that has a surface area of 780,000 m^2 was monitored at a specific month. Over this period, an inflow of 1.75 m^3/s and an outflow of 1.5 m^3/s were recorded for the lake, in which a storage change was also observed to be 780,000 m^3. During the same month, precipitation was estimated to be 25 cm. If the seepage loss is neglected, please determine the evaporation loss for the lake (in cm).

2. (15 pts) If the capacity of a stream channel is 250 m^3/s that is the peak flow of the 10-year storm of the watershed, please determine the probability that
   (a) (5 pts) the peak will flood next year.
   (b) (5 pts) the peak will flood at least once in the next ten years.
   (c) (5 pts) the peak will flood three times in the next ten years.

3. (15 pts) Table 1 lists the incremental rainfall data for a storm that was recorded at a rainfall gauge located at an urban watershed.
   (a) (5 pts) Plot the rainfall hyetograph.
   (b) (5 pts) Find the total rainfall volume (in cm).
   (c) (5 pts) Determine the ϕ index (in cm/hr) if the direct runoff induced by the rainfall was 305 cm.

Table 1

Time (hr)	Rainfall (cm)	Time (hr)	Rainfall (cm)
0	0	2.5	10.0
0.5	5.0	3.0	4.5
1.0	5.5	3.5	3.0
1.5	10.0	4.0	2.5
2.0	12.0	4.5	0

4. (20 pts) A 50-cm well fully penetrates an aquifer of 30-m depth. Two observation wells located 32 m and 75 m from the pumped well are known to have drawdowns of 7 m and 6.5 m, respectively. If the flow is steady and the hydraulic conductivity is 0.034 m/min,
   (a) (10 pts) please find the discharge from the well if the aquifer is unconfined.
   (b) (10 pts) please find the discharge from the well if the aquifer is confined.

(背面仍有題目,請繼續作答)

5. (30 pts) Given the 3-hour unit hydrograph, $U(3,t)$, in Table 2 for a watershed, please determine

Table 2

Time (hr)	0	1	2	3	4	5	6	7	8	9	10
$U(3,t)$ (cms)	0	2	7	17	33	42	39	25	11	4	0

(a) (15 pts) the area of the watershed (in hectare)

(b) (15 pts) the hydrograph induced by a 4-hour storm that has the following rainfall intensity

Time (hr)	1	2	3	4
Intensity (cm/hr)	2.5	3.5	3.5	3.5

with the ϕ index and the base flow being 5 mm/hr and 20 cms, respectively.