

1. 試釋下列各名詞

(a) 田野容量 (Field Capacity)

(b) 田野含水量 (Field Moisture) (或謂曰水不足) (Deficiency)

(c) 伏瀑流 (Subsurface Stormflow) Potential-

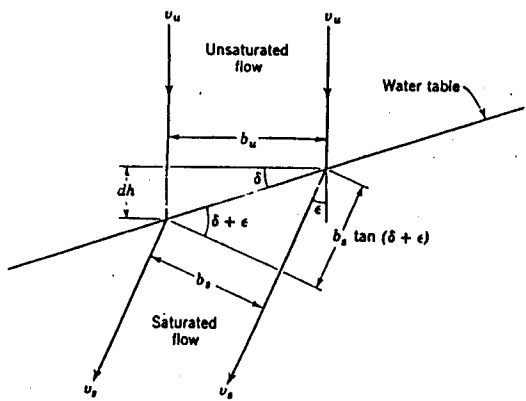
(d) 滲入容量 (Infiltration Capacity)

(e) 潛蒸發散 (Evapo-transpiration)

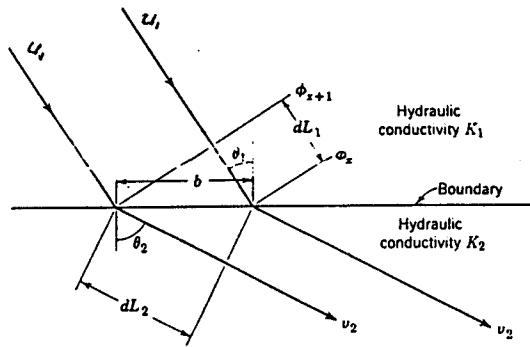
2. 何謂合成單位歷線 (Synthetic Unit Hydrograph) 及瞬時單位歷線 (Instantaneous Unit Hydrograph) 二者之意義及功能各如何?

3. (一) 設水在地下經由滲漏到達地下水而產生折射作用如圖(a), 試求折射角  $\epsilon$  與水面傾角  $\delta$  之關係

(二) 如地下透水層有二層, 其透水係數 (Permeability Coefficient, Hydraulic Conductivity) 分別為  $K_1$  及  $K_2$ , 試求  $K$  與  $\theta$  之關係 (如圖 b)



圖(a)



圖(b)

4. 試作洪水追跡演算。在一河段  $K=36 K_1$ ,  $x=0.15$  其上游站之進流量歷線紀錄為:

時間 (hr)	0	12	24	36	48	60	72	84	96	108	120
進流量 (cms)	42	45	88	272	342	288	240	198	162	133	110
時間 (hr)	132	144	156	168	180	192	204	216	228	240	
進流量 (cms)	90	79	68	61	56	54	51	48	45	12	

試求該河段下游處之出流量歷線。

尖峰流量減少為何?

出流量之尖峰時間?

5. 試求 Log-Pearson Type III 之 10 年及 100 年一次之洪水

Year	Month	Discharge, ft <sup>3</sup> /s
1911	June	39,500
1912	May	61,900
1913	May	76,600
1914	May	42,200
1915	May	28,200
1916	June	56,000
1917	June	70,500
1918	May	52,800
1919	May	52,000
1920	May	43,600
1921	May	69,700
1922	June	62,400
1923	May	49,600
1924	May	58,900
1925	May	59,800
1926	April	35,900
1927	June	68,600
1928	May	72,100
1929	May	52,700
1930	April	31,000
1931	May	40,800
1932	May	72,100
1933	June	81,400
1934	April	45,900
1935	May	44,000
1936	May	63,200
1937	May	34,300
1938	April	63,400
1939	May	46,000
1940	May	37,100
1941	May	28,900
1942	May	37,100
1943	May	52,200
1944	May	34,200
1945	May	44,400
1946	May	36,600
1947	May	69,900
1948	May	99,000
1949	May	76,200
1950	June	62,600
1951	May	44,200
1952	April	49,200
1953	June	53,100
1954	May	58,800
1955	June	64,100
1956	May	77,800
1957	May	71,200

K VALUES FOR THE LOG-PEARSON TYPE III DISTRIBUTION

Skew coefficient <i>g</i>	Recurrence interval, years							
	1.0101	1.2500	2	5	10	25	50	100
	Percent chance							
	99	80	50	20	10	4	2	1
3.0	-0.667	-0.636	-0.396	0.420	1.180	2.278	3.152	4.051
2.8	-0.714	-0.666	-0.384	0.460	1.210	2.275	3.114	3.973
2.6	-0.769	-0.696	-0.368	0.499	1.238	2.267	3.071	3.889
2.4	-0.832	-0.725	-0.351	0.537	1.262	2.256	3.023	3.800
2.2	-0.905	-0.752	-0.330	0.574	1.284	2.240	2.970	3.705
2.0	-0.990	-0.777	-0.307	0.609	1.302	2.219	2.912	3.605
1.8	-1.087	-0.799	-0.282	0.643	1.318	2.193	2.848	3.499
1.6	-1.197	-0.817	-0.254	0.675	1.329	2.163	2.780	3.388
1.4	-1.318	-0.832	-0.225	0.705	1.337	2.128	2.706	3.271
1.2	-1.449	-0.844	-0.195	0.732	1.340	2.087	2.626	3.149
1.0	-1.588	-0.852	-0.164	0.758	1.340	2.043	2.542	3.022
0.8	-1.733	-0.856	-0.132	0.780	1.336	1.993	2.453	2.891
0.6	-1.880	-0.857	-0.099	0.800	1.328	1.939	2.359	2.755
0.4	-2.029	-0.855	-0.066	0.816	1.317	1.880	2.261	2.615
0.2	-2.178	-0.850	-0.033	0.830	1.301	1.818	2.159	2.472
0	-2.326	-0.842	0	0.842	1.282	1.751	2.054	2.326
-0.2	-2.472	-0.830	0.033	0.850	1.258	1.680	1.945	2.178
-0.4	-2.615	-0.816	0.066	0.855	1.231	1.606	1.834	2.029
-0.6	-2.755	-0.800	0.099	0.857	1.200	1.528	1.720	1.880
-0.8	-2.891	-0.780	0.132	0.856	1.166	1.448	1.606	1.733
-1.0	-3.022	-0.758	0.164	0.852	1.128	1.366	1.492	1.588
-1.2	-3.149	-0.732	0.195	0.844	1.086	1.282	1.379	1.449
-1.4	-3.271	-0.705	0.225	0.832	1.041	1.198	1.270	1.318
-1.6	-3.388	-0.675	0.254	0.817	0.994	1.116	1.166	1.197
-1.8	-3.499	-0.643	0.282	0.799	0.945	1.059	1.069	1.087
-2.0	-3.605	-0.609	0.307	0.777	0.895	0.959	0.980	0.990
-2.2	-3.705	-0.574	0.330	0.752	0.844	0.888	0.900	0.905
-2.4	-3.800	-0.537	0.351	0.725	0.795	0.823	0.830	0.832
-2.6	-3.889	-0.499	0.368	0.696	0.747	0.764	0.768	0.769
-2.8	-3.973	-0.460	0.384	0.666	0.702	0.712	0.714	0.714
-3.0	-4.051	-0.420	0.396	0.636	0.660	0.666	0.666	0.667

Year	Month	Discharge, ft <sup>3</sup> /s
1958	May	59,600
1959	June	55,100
1960	May	49,600
1961	May	58,600
1962	April	39,700
1963	May	38,200
1964	June	103,000
1965	May	47,900

Mean:  $\log \bar{X} = \frac{\sum \log X}{n}$

Standard deviation:  $\sigma_{\log X} = \sqrt{\frac{\sum (\log X - \log \bar{X})^2}{n - 1}}$

Skew coefficient:  $g = \frac{n \sum (\log X - \log \bar{X})^3}{(n - 1)(n - 2)(\sigma_{\log X})^3}$