

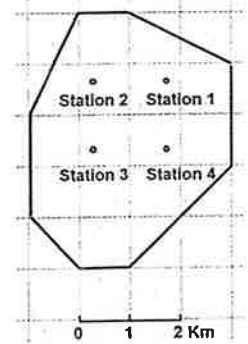
臺灣綜合大學系統 113 學年度學士班轉學生聯合招生考試試題

科目名稱	水文學	類組代碼	D36
		科目碼	D3693

※本項考試依簡章規定所有考科均「不可」使用計算機。 本科試題共計 1 頁

1. The total rainfall of a 3-hour storm event of a small reservoir watershed is shown in the table. The analyzed total inflow of the reservoir was  $1.4 \times 10^6 \text{ m}^3$ .

Station	1	2	3	4
Rainfall (mm)	110	120	90	80



- (a). Please calculate the average rainfall using Thiessen method. (10%)  
 (b). If the infiltration is the only rainfall loss we considered here (ignore other loss). What is the total infiltration depth of this storm event? (10%)

2. What are the five basic assumptions of the Unit Hydrograph? (20%)

3. An observed hydrograph tabulated below is from a newly developing watershed after 5 mm effective rainfall in 20 minutes.

Time (min)	0	10	20	30	40	50	60	70	80	90	100	110
streamflow (cms)	2.00	2.50	3.75	5.50	8.00	8.75	7.25	5.75	4.25	3.00	2.25	2.00

- (a). What is the watershed area? (6%)  
 (b). What will be the new observed hydrograph after 15 mm effective rainfall in 10 minutes in the future (if the rainfall loss and baseflow remain the same)? (14%)

4. An engineer collected 50 annual maximum streamflow data of a gauge station. Assume the annual maximum streamflow fits the log-normal distribution. The median of the streamflow data series is 200 cms. The standard deviation of the logarithmic streamflow data series is 0.081. If the watershed area is 500 hectares and the runoff coefficient is 0.82. (a). Please estimate the 20-year designed storm event. (b) Please estimate the designed storm event if the lifetime of the project is 25 years and set the risk at 40% to protect the watershed. ( $\log 20=1.301$ ,  $\log 25=1.398$ ,  $\log 50=1.699$ ,  $\log 200=2.301$ ;  $0.6^{0.02}=0.990$ ,  $0.6^{0.04}=0.980$ ,  $0.6^{0.05}=0.975$ )

Standard normal random variable Z

Z	0	0.253	0.400	0.600	0.820	0.915	1.645	1.751	2.054
P (Z)	0.500	0.600	0.655	0.726	0.794	0.820	0.950	0.960	0.980

(20%)

5. Please explain the porosity, field capacity, and wilting point. For the same soil, rank the values of these three parameters. (10%)

6. Please describe the basic hydrological characteristics of Taiwan hydrology. (10%)