

臺灣綜合大學系統 111 學年度學士班轉學生聯合招生考試試題

科目名稱	<b>水文學</b>	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. Please explain following terms

- (a). Rational Method. (5%)
- (b). Time of Concentration. (5%)
- (c). Rating Curve. (5%)
- (d). Specific Retention. (5%)

2. Please explain how to estimate the 100-year event from 50 years daily maximum streamflow data. (15%)

3. The 40-minute unit hydrograph tabulated below is for a watershed.

Time (min)	0	20	40	60	80	100	120	140	160
UH (cms)	0	6	16	26	28	18	9	3	0

- (a). What is the watershed area? (6%)
- (b). What is the direct runoff hydrograph (DRH) that would be observed from the following effective rainfall data? (24%)

Time (min)	0~40	40~60
Effective rainfall (cm)	0.5	1

4. The inflow hydrograph of a reservoir is tabulated below. When  $t = 0$  day, the storage ( $S$ ) of the reservoir is  $30 \text{ m}^3/\text{s}/\text{day}$  and the outflow ( $Q$ ) is  $0 \text{ m}^3/\text{s}$ . Please calculate the outflow of the 3<sup>rd</sup> day when  $\Delta t = 1$  day and the relationship of outflow ( $Q$ ) and storage ( $S$ ) is shown as

$$Q = \begin{cases} \frac{1}{5} \left( \frac{2S}{\Delta t} + Q - 100 \right) & \text{for } \frac{2S}{\Delta t} + Q > 100 \\ 0 & \text{otherwise} \end{cases}$$

Time (days) $t$	0	1	2	3	4	5	6	7	8	9
Inflow ( $\text{m}^3/\text{s}$ )	0	12	24	38	50	40	30	20	10	5

(20%)

5. Assume the annual maximum streamflow of a station is normal distribution. The median of the streamflow data series is 850 cms. The standard deviation of the streamflow data series is 120 cms. Please estimate the 2-year designed storm event? (standard normal random variable  $Z$ :  $Z \leq -0.84$ ,  $P = 0.2$ ;  $Z \leq 0$ ,  $P = 0.5$ ;  $Z \leq 1$ ,  $P = 0.8413$ ;  $Z \leq 2$ ,  $P = 0.9772$ ) (15%)