

淡江大學九十三年學年度碩士班招生考試試題

系別：水資源及環境工程學系

科目：水 文 學

准帶項目請打「○」否則打「x」
簡單型計算機
○

本試題共 1 頁

1. Derive the permeability equation from the falling head permeability test  $k = 2.303 \frac{aL}{At} \log_{10} \frac{h_1}{h_2}$

Where  $a$  = Cross-sectional area of the standpipe

$A$  = Cross-sectional area of the soil specimen

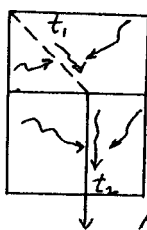
$h_1$  : the initial head difference at  $t=0$

$h_2$  : the final head difference at time  $t=t_2$

(20%)

2. An 18 in. Well fully penetrates an unconfined aquifer of 100 ft depth. Two observation Wells located 100 and 235 ft from the pumped well are known to have drawdowns of 22.2 and 21 ft, respectively. If the flow is steady and the hydraulic conductivity  $K = 1320 \text{ gpd/ft}^2$ , what would be the discharge (gpm)? (20%)

3. Use the rational method to find the design run off for the area shown in Fig A. The rainfall intensity is 4.2 in/hr.



$A_1 = 3 \text{ acres}$   
 $C_1 = 0.3$   
 $t_1 = 15 \text{ min}$   
 $A_2 = 4 \text{ acres}$   
 $C_2 = 0.7, t_2 = 5 \text{ min}$

Fig A.

(20%)

4. Determine the outflow hydrograph resulting from the probable maximum flood (PMF) out reservoir from the following data:  
 Reservoir plane area at spillway crest level = 0.8  $\text{km}^2$   
 Reservoir plane area 3 m above spillway crest level = 1.0  $\text{km}^2$   
 Spillway type = Circular shaft  
 discharge equation:  $Q = 64 h^{3/2}$   
 discharge preceding occurrence of PMF = 5  $\text{m}^3/\text{s}$   
 PMF

(40%)

time (h)	0	2	4	6	8	10	12	14	16	18	20
inflow ( $\text{m}^3/\text{s}$ )	5	8	15	30	85	160	140	95	45	15	10