

國立臺北科技大學

九十二學年度環境規劃與管理研究所碩士班入學考試

水資源概論試題

填准考證號碼

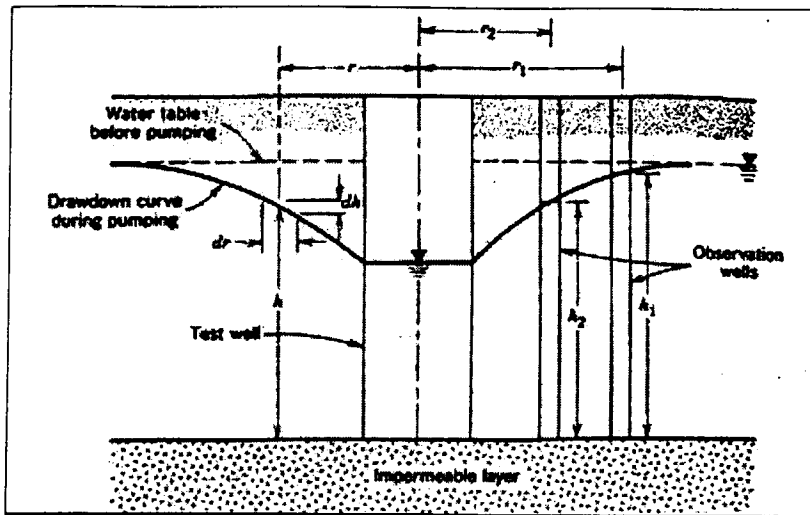
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注意事項：

1. 本試題共八題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。

- 1、Please **brief** the following terms or equation : (1) Artesian aquifer (2) IDF or FID curve (3) Horton equation (4) Time of concentration (5) Nonstructural BMPs (3 points each, 15 points total)
- 2、Please describe three possible methods for seawater purification, also **brief** their theories. (15 points)
- 3、Please describe the possible factors affecting “first flush” pollution. The pollution could be for a reservoir or sewerage system. (15 points)
- 4、An unconfined aquifer diagram is shown as follows. Please derive the necessary equation and calculate the steady-state discharge, if the drawdown at observation wells remains constant at 4 m and 3 m corresponding to observation wells 20 m and 40 m from the proposed well location. The unconfined aquifer permeability is $5 \text{ m}^3/\text{m}^2\text{-min}$ and the aquifer thickness is 20 m. (15 points)



- 5、 Please describe the phenomenon of “temperature stratification in a reservoir”, the causing problems for the reservoir and the possible solutions. (10 points)
- 6、 A sewage plant effluent with 20 mg/L of total nitrogen (TN as N) is planned to be reused and is targeted for 10 mg/L TN as N. Please provide your thinking for how to deal with this problem if you are the engineers. (10 points)
- 7、 Please describe (1) Energy gradient and hydraulic gradient from Bernoulli equation. (2) How to distinguish “supercritical flow” and “subcritical flow”? (10 points)
- 8、 A groundwater is contaminated due to the underground tank leakage from gas station. Please provide your thinking of solving this problem and also assess the pros and cons for the methods you provide. (10 points)