

1. Define and explain the following terms (35%)
  - (a) Interception (5%)
  - (b) Unit hydrograph (5%)
  - (c) Rational model (5%)
  - (d) Darcy's law (5%)
  - (e) Confined aquifer (5%)
  - (f) Base flow (5%)
  - (g) Return period (5%)
2. Describe the procedures of at least two methods for estimating basin average rainfall. (10%)
3. Describe the energy balance method for estimating the evaporation of bare soil. (10%)
4. A rainfall event in a 200 km<sup>2</sup> watershed was given in the following table. If the measured direct runoff depth of this event was 59 mm, calculate the value of  $\Phi$  index in mm for estimating the averaged infiltration rate. (10%)

Time (hr)	0	1	2	3	4
Rainfall (mm)	0	50	50	70	30

5. Assuming forest is the major land cover in a small watershed. What will happen to the hydrological cycles of this watershed when forest was removed and a golf course was built? (10%)
6. An unconfined aquifer has a depth of 50 m, a surface area of 20 km<sup>2</sup>, a porosity of 0.4, and a specific yield of 0.15 (1) How much water was stored in the aquifer? (2) How much water can be released from the aquifer when the water table decreases 5 m? (10%)
7. Define and explain the soil water status: (1) field capacity and (2) wilting point. How to use field capacity and wilting point to estimate the available water content for plant use. (15%)