

**Alp 2203: Principles of Hydrology  
CAT I**

45 minutes

**Answer All Questions**

- Q1 a) Explain the process of formation precipitation. (5 marks)  
 b) Explain briefly how rainfall is measured in a Meteorological station. (5 marks)  
 c) Explain how areal rainfall is determined using the Isohyetal method (5 marks)
- Q2 a) Explain briefly the factors that affect evaporation. (6 marks)  
 b) A psychrometer indicates a dry-bulb temperature of 40°C and wet bulb temperature of 30°C. Calculate the vapour pressure, Saturation Vapour Pressure and the relative humidity. (6 marks)
- Q3 a) Sketch and explain the components of the hydrologic cycle. (5 marks)  
 b) Sketch and explain the terms in Horton's infiltration equation (5 marks)

**Alp2303: Principles of Hydrology**

45 minutes

**CAT II**

- Q1 a) Explain how river gauging exercise is carried out. (10 marks)  
 b) The following data were collected at a gauging station on a stream. Compute the discharge by (a) the mid-section method (b) the mean-section method. (10 marks)

Distance from one bank (m) (b)	0	3	6	9	12	15	18	21	24	27
Water depth (m) (d)	0	1.5	3.2	5.0	9.0	5.5	4.0	1.6	1.4	0
Mean velocity (m/s) (v)	0	0.12	0.24	0.25	0.26	0.24	0.23	0.16	0.14	0

Q2 The ordinates of 1-hrt unit hydrograph are given as below

Time (h)	0	1	2	3	4	5	6	7
$u(t)(m^3 s^{-1})$	0	12	35	24	16	8	3	0

- a) Use the data to derive an S-curve. (4marks)  
 b) Use the S-curve to determine 3- and 5-hrs unit hydrographs. (6 marks)

$$e_s = 611 \exp\left(\frac{17.27T}{237.3+T}\right) \text{Pa}$$