

KATHMANDU UNIVERSITY
End Semester Examination
February, 2025

Level : B.E.
Year : II
Time : 2 hrs. 30mins.

11 FEB 2025

Course : CIEG 206
Semester : II
F. M. : 40

SECTION "B"

Make suitable assumptions wherever needed. The figures in the parenthesis indicate the marks allocated for the question.

1. Explain various types of saturated formation. Also, explain the flow in parallel and normal stratification. [2+2]
2. Write short notes on (*ANY THREE*) [3×3=9]
 - a. Flood routing
 - b. Flow duration curve
 - c. Horizontal axis and vertical axis current meter
 - d. Physical and mathematical modeling
3. A 20 cm well completely penetrates an unconfined aquifer of saturated depth 36 m. After a long period of pumping at a steady rate of 500 lpm, the drawdown in two observation wells 25 and 50 m from the pumping well was found to be 3.5 and 2.0 m respectively. Determine the transmissivity of the aquifer. What is the drawdown at the pumping well? [2+2]
4. A weir has an expected life of 30 years and is designed for a flood magnitude of return period of 100 years. (a) What is the risk of this hydrologic design? If a 5 % risk is acceptable, what return period will have to be adopted? [1.5+1.5]
5. Estimate the constant rate of withdrawal from a 1200 ha reservoir in a month of 30 days during which the reservoir level dropped by 0.8 m despite an average inflow into the reservoir of 0.4 million m³/day. During the month the average seepage loss from the reservoir was 2.0 cm, total precipitation was 20 cm and total evaporation was 8.5cm. [3]
6. The ordinate of a 6-hour UH of a basin of area 125 km² is given below.

T (hr)	0	6		12	18	24	30	36	42	48	54	60	66	72	
UH (m ³ /s)	0	35		60	90	135	180	210	165	110	90	65	30	15	0

Calculate 6-hr DRH for a rainfall of 3.5cm with Φ -index 0.4cm. [4]
7. Using 30 years of data and Gumbel's method, the magnitude of flood for a return period of 100 years and 50 years for a river is 650 m³/s and 450 m³/s respectively.
 - a. Estimate the magnitude of a flood with a return period of 200 years taking reduced mean and reduced standard deviation 0.55 and 1.12 respectively. [3]
 - b. What is the 95 % confidence limits for this estimate if 95 % = 1.96 [1]
8. What are the types of samplers used in measuring suspended load? Explain in brief the method of estimation of bed load. [2+2]
9. What are the impacts of sediment in hydropower? Explain in brief the strategies for sediment management. [2+3]

