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C 3118

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Sixth Semester

Civil Engineering

CE 1001 — HYDROLOGY

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the various types of precipitation?
2. What are the advantages of Recording type rain gauges?
3. What are the factors affecting evaporation?
4. Define ϕ -index.
5. Distinguish between hyetograph and hydrograph.
6. Define S-curve hydrograph.
7. Define Recurrence interval.
8. What are the various types of Flood Routing?
9. Define Storage Coefficient.
10. State Darcy's law and its limitations.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the hydrologic cycle and its importance. (8)
(ii) What are the various methods of determining average rainfall over a basin? (8)

Or

- (b) (i) Describe the working principle of any one of the Recording type rain gauges with a neat sketch. (8)
(ii) Describe the intensity, duration and frequency relationship with the curves. (8)

12. (a) (i) Write short notes on infiltration indices. (8)
(ii) A 6 hour storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/hr in successive one hour intervals over a basin of 800 sq.km. The resulting runoff was observed to be 2640 hectare-metres. Determine the ϕ -index for the basin. (8)

Or

- (b) (i) How do you measure infiltration? Explain. (8)
(ii) What are the various methods of reducing Reservoir evaporation? (8)

13. (a) (i) How do you separate base flow from surface run-off? (8)
(ii) How do you derive unit hydrograph? (8)

Or

- (b) (i) What are the assumptions and limitations of Unit hydrograph theory? (8)
(ii) How do you derive Synthetic unit hydrograph? (8)

14. (a) (i) Explain Muskingum's method of flood routing. (10)
(ii) Distinguish between : (6)
(1) Channel routing and reservoir routing.
(2) Hydraulic routing and hydrologic routing.
(3) Prism storage and wedge storage.

Or

- (b) Explain the various methods to determine the recurrence interval of a storm. (16)

15. (a) (i) Derive the equation for steady radial flow into the confined aquifer. (8)
- (ii) A 20 cm diameter well penetrates 30 m below static water level (G.W.T.). After a long period of pumping at a rate of 0.03 cumecs, the drawdowns in the observation wells at 12 m and 36 m from the pumped well are 1.00 m and 0.5 m respectively. Determine
- (1) the transmissibility of the aquifer.
 - (2) the drawdown in the pumped well assuming radius of influence of 300 m.
 - (3) the specific capacity of the well. (8)

Or

- (b) (i) Explain : (8)
- (1) Recuperation test.
 - (2) Pumping test.
- (ii) What are the various types of aquifers? Explain with neat sketches. (8)