

## Code: 9A01503



Max Marks: 70

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

## WATER RESOURCES ENGINEERING - I

(Civil Engineering)

Time: 3 hours

# Answer any FIVE questions

### All questions carry equal marks

- 1 What is hydrology? Explain the various terms associated with hydrologic cycle.
- (a) Explain water-budget method. 2
  - (b) Explain Penman equation.
- (a) What are the various components of runoff? Explain each. 3
  - (b) Explain ultrasonic method of stream flow measurement.
- (a) What is a unit hydrograph? List the assumptions involved in the unit hydrograph theory. 4
  - (b) Given below are the ordinates of a 4-h unit hydrograph. Derive the ordinates of a 12-h unit hydrograph for the same catchment.

Col(1)	0	4	8	12	16	20	24	28	32	36	40	44
Col(2)	0	20	80	130	150	130	90	52	27	15	5	0
Col(1) indicates Time(h)												
col (2) is in m <sup>3</sup> /s.												

Here Col(1) indicates Time(h) And Col (2) is in  $m^3/s$ .

- (a) Explain the terms "Storage coefficient' and 'Coefficient of transmissibility'. 5
  - (b) During a recuperation test, the water in an open well was depressed by pumping by 2.5 m and it recuperated 1.8 m in 80 minutes. Calculate the yield from a well 4 m diameter under a depression head of 3 m.
- (a) What are the different types of irrigation systems? Discuss each of these systems briefly. 6
  - (b) Describe layout of fields, irrigation and drainage systems.
- (a) Explain the terms: 7
  - (i) Soil moisture tension.
  - (ii) Soil moisture stress.
  - (b) Explain the terms 'Duty' and 'Delta'. Derive a relationship between the two for a given base period.
- (a) What are different types of earth lining? Discuss. 8
  - (b) Derive an expression for the silt supporting capacity of a channel according to Kennedy's theory.

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