Code: 13A01504 **R13**

B.Tech III Year I Semester (R13) Supplementary Examinations June 2016

WATER RESOURCES ENGINEERING – I

(Civil Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) What are the various types of precipitation?
(b) Define: (i) Infiltration. (ii) Evaporation.
(c) What are the uses of unit hydrograph?
(d) Define: (i) Aquifer. (ii) Aquifuge.
(e) Define: (i) Duty. (ii) Delta.
(f) Write about (i) Kor Depth. (ii) Kor Period.
(g) Define: (i) Borrow Pit. (ii) Spoil Bank.
(h) What is reclamation of soils?
(i) What is the difference between weir and barrage?
(j) Define: (i) Downing Ratio. (ii) Modular limit.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Explain about any two types of rain gauges with neat diagrams

(b) In a certain river basin, there are four rain gauge stations, with their normal annual precipitation amounting to 900, 500, 600 and 300 mm, respectively. Determine the optimum number of rain gauges in the catchment, if it is desired to limit the error in the mean value of rainfall in the catchment to 10%.

OR

3 (a) Write about the factors affecting: (i) Evaporation. (ii) Infiltration capacity.

(b) Explain about the methods of: (i) Estimating the evaporation loss. (ii) Reducing the evaporation loss from a free-water surface.

UNIT – II

4 Convert the following 2 hour unit hydrograph to a 3 hour unit hydrograph using the S-curve method.

Time (Hour)	2 hour unit hydrograph ordinate (cubic feet/s)
0	0
1	75
2	250
3	300
4	270
5	190
6	100
7	70
8	40
9	20
10	0

OR

5 (a) Derive Dupuit formula for an unconfined aquifer.

(b) A 35 cm diameter well penetrates 25 m below the static water table. After 24 hours of pumping at 5500 liters per minute, the water level in a test well at 100 m away is lowered by 0.6 m and in the well 30 m away, the drawdown is 1.1 m. What is the transmissibility of the aquifer?

Contd. in page 2

UNIT – III

6 Explain about the various methods in which the irrigation water can be applied to the fields with neat diagrams.

OR

7 Write about:
(a) Indian agricultural soils.
(b) Soil fertility.
(c) Soil-water-plant relationship.
(d) Command area.
(e) Consumptive use of water.

UNIT – IV

8 Compare Kennedy's theory to Lacey's regime theory.

OR

9 Design a concrete lined trapezoidal channel to carry a discharge of 220 cumecs at a slope of 1 in 5500. The side slopes of the channel are 1:1 and Manning's coefficient is 0.015. The limiting velocity in the channel is 2.1 m/s.

UNIT – V

10 Write about (i) Bligh's creep theory. (ii) Khosla theory.

OR

11 Explain in detail about:
(a) Hyper-proportional outlet.
(b) Efficiency of an outlet.
(e) Canal Escape.

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