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Code No: 115AC

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, May - 2018

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WATER RESOURCES ENGINEERING-I

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

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PART - A

(25 Marks)

- 1.a) List the factors that affect the runoff from catchment area. [2]
- b) Describe various types of precipitation. [3]
- c) What is effective rainfall? [2]
- d) Write down the assumptions of unit hydrograph. [3]
- e) Define aquiclude. [2]
- f) Draw the divisions of sub-surface water. [3]
- g) List the importance of irrigation. [2]
- h) What are the ill effects of irrigation? [3]
- i) How do you classify the canal, based on the functions of the canal? [2]
- j) What are the disadvantages of canal lining? [3]

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PART - B

(50 Marks)

- 2.a) Explain tipping bucket type rain gauge with a neat sketch.
- b) Describe the factors affecting infiltration. [5+5]

OR

- 3.a) Explain any one method of estimation of evaporation in detail.
- b) Describe any two methods of computing average rainfall over the basin. [5+5]

- 4.a) What is unit hydrograph? How do you construct it?
- b) Describe the two methods of separating base flow from the total runoff. [5+5]

OR

5. The ordinates of a 4h unit hydrograph of a basin area 300km^2 measured at 1h intervals are 6,36,66,91,106,93,79,68,58,49,41,34,27,23,17,13,9,6,3 and $1.5\text{ m}^3/\text{s}$ respectively. Obtain the ordinates of a 3h unit hydrograph for the basin using the S-curve technique. [10]

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- 6.a) Explain the types of aquifer.
- b) How do you determine the yield of the open well from recuperation test? [5+5]

OR

7. Explain in detail the types of tube wells along with their construction details. [10]

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8. Explain in detail the factors affecting duty. [10]

OR

9. After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop, if

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- a) Field capacity of soil = 27%
- b) Permanent wilting point = 14%
- c) Dry density of soil = 15 kN/m^3
- d) Effective depth of root zone = 75 cm
- e) Daily consumptive use of water for the given crop = 11 mm.

[10]

AG 10. Design a regime channel for a discharge of $35 \text{ m}^3/\text{s}$ with silt factor of 0.9 by Lacey's theory, taking side slopes as 1H:2V. [10] AG AG AG A

OR

- 11.a) Explain the balancing depth of cutting
- b) Explain the flood frequency analysis method.

[5+5]

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