

Code No: 115AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2017

WATER RESOURCES ENGINEERING – I

(Common to CE, CEE)

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.

PART - A**(25 Marks)**

- 1.a) Define ϕ index and explain. [2]
- b) Draw and describe with neat sketch of hydrologic cycle. [3]
- c) Differentiate the effluent stream and influent stream. [2]
- d) Explain the flood hydrograph. [3]
- e) Define confined and unconfined aquifers. [2]
- f) Classify the specific capacity and specific draw down. [3]
- g) What is duty and relate with delta. [2]
- h) Describe the drip irrigation system. [3]
- i) Draw neat sketch of ridge canal. [2]
- j) Describe feeder canal, carrier canal and branch canal. [3]

PART - B**(50 Marks)**

- 2.a) What are different types of precipitations? Describe each.
- b) A basin has the area in the form of a pentagon with each side of length 50km. The five rain gauges located at the corners A,B,C,D and E have recorded 80,91, 93, 69, and 65mm respectively. Compute the average depth of rain fall over the basin using the Arithmetic mean and Thiessen methods [5+5]

OR

- 3.a) Discuss the factors affecting the runoff.
- b) The rate of rain fall for successive 30min period of 210 min storm are 4.5, 5, 13, 9.5, 5.5, 5.5 and 4cm/hr. assuming the ϕ index of 4.5 cm/hr, find the net rain fall over the basin in cm, the total rain fall and value of W- index. [5+5]

- 4.a) What is synthetic hydrograph? Describe with neat sketch.

- b) What is a unit hydrograph? How do you obtain from the given direct runoff? [5+5]

OR

- 5.a) Explain the types of wells with neat sketch.

- b) The ordinate of 6 hr UH are given derive the 12hr UH [5+5]

Time (hr) 0,6,12,18,24,30,36,42,48,54,60

12hr(UGO)discharge (cumec) 0,5,13,30,35,32,20,14,8,4,0

6.a) Ground water flows through an aquifer with cross section area of $1 \times 10^4 \text{ m}^2$ and a length of 1500 m. hydraulic heads are 300m and 250m at the ground water entry and exit points in the aquifer, respectively. Ground discharge into a stream at the rate of $1500 \text{ m}^3/\text{day}$. What is the hydraulic conductivity of the aquifer? If the porosity of the aquifer is 0.3, what is the pore velocity of water.

b) Obtain expression for the steady radial flow to wells in unconfined aquifers. [5+5]

OR

7.a) A tube well of 30m diameter penetrates fully in the artesian aquifer. The strainer length is 15m. Calculate the yield from the well under a drawdown of 3m. The aquifer consists of sand with effective size of 0.2mm having coefficient of permeability equal to 50m/day. Assume radius of influence is equal to 150m.

b) Explain the perched aquifer and water table aquifer. [5+5]

8.a) What is sprinkler irrigation? Discuss the advantages and disadvantages.

b) Discuss the various Indian agriculture soils and how to improve their methods of improving soil fertility. [5+5]

OR

9.a) Classify the types of irrigation efficiencies.

b) Write short note on water logging, crop rotation, and soil water and plant relation. [5+5]

10.a) How do you classify the type of canals? Explain any two.

b) Write the design procedure of irrigation canal using the Kennedy theory. [5+5]

OR

11.a) What is design discharge over catchment area? Explain SCS method of design discharge.

b) How many methods stream flow can be measured? [5+5]

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