III B. Tech II Semester Regular/Supplementary Examinations, August-2021
WATER RESOURCES ENGINEERING–I
(Civil Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A　　　　　　　　　　　　　　　　　**(14 Marks)**
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1. a) State the necessity and applications of Intensity-Duration Frequency Curves. [2M]
   b) Enumerate the various methods with equations adopted for estimation of Evapotranspiration. [2M]
   c) List the limitations of Unit Hydrograph. [2M]
   d) What is the significance of Standard and Probable Maximum Flood? [3M]
   e) Highlight the assumptions of Dupit's equation. [3M]
   f) Give the detailed classification of Hydrologic models. [2M]

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PART –B　　　　　　　　　　　　　　　　　**(56 Marks)**
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2. a) Explain with sketch, Thiessen's method for calculating average depth of precipitation over an area. Also discuss the merits and demerits of these methods over the other methods. [7M]
   b) Explain as to how weather affects precipitation, and precipitation in turn affects the design of water resources projects? [7M]

3. a) Discuss in detail the methods of computing Infiltration capacity. [7M]
   b) Explain Dalton's law for evaporation from water surfaces. For a large water surface, explain the influence of depth on the rate of evaporation. [7M]

4. a) Determine designed discharge for a combined system serving population of 45000 with rate of water supply of 135 LPCD. The catchment area is 125 hectares and average coefficient of runoff is 0.60. The time of concentration for the design rainfall is 30 min and relation between intensity of rainfall and duration is I=1000/(t+20). [7M]
   b) Find out the ordinates of a storm hydrograph resulting from a 3-hr storm with rainfall of 3, 4.5 and 1.5 cm during subsequent 3 hours intervals. The ordinates of unit hydrograph are given in below table: [7M]

Time (hr)	0	3	6	9	12	15	18	21	24	3	6	9	12
3hr. UGO (cumec)	0	90	200	350	450	350	260	190	130	80	45	20	0

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5. a) Define the term Return Period. What return period you would adopt in the design of a culvert on a drain if you are allowed to accept only 5% risk of flooding in the 25 years of expected life of the culvert? [7M]

   b) Enumerate the equations adopted and procedure involved in Muskingum method of flood routing. [7M]

6. a) Derive the equation for discharge from an unconfined aquifer for steady flow along with the assumptions and limitations. [7M]

   b) What are various types of wells? What is meant by tube well? With a neat sketch explain about, most widely used tube well. [7M]

7. a) Highlight the advantages and applications of Instantaneous Unit Hydrographs for Rainfall-Runoff Modeling. [7M]

   b) How are advanced hydrological models superior than the conventional hydrological models? Explain in detail. [7M]

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