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Roll No. :

320556(20)

B. E. (Fifth Semester) Examination, Nov.-Dec. 2021

(New Scheme)

(Civil Engg. Branch)

ENGINEERING HYDROLOGY

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : All units are compulsory. Part (a) of each units is compulsory and carrying 2 marks. Attempt any two parts from (b), (c) & (d) of each unit carrying 7 marks. Assume any suitable data necessary if required and mention it clearly.

Unit-I

1. (a) Discuss the practical application of hydrology in engineering.

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- (b) Describe the necessity for the hydrological data and explain water budget equation. 7
- (c) Describe the hydrological cycle with neat sketch. 7
- (d) Explain the following : 7
- (i) Air mass
 - (ii) Air front
 - (iii) Anti-cyclone
 - (iv) Cyclone

Unit-II

2. (a) Define 'point rainfall'. 2
- (b) Describe briefly the types and forms of precipitation. 7
- (c) Rain gauge station X did not function for a part of a month during which a storm occurred. The storm product rainfall of 84 mm, 70 mm and 96 mm at three surrounding station A , B and C respectively. The normed annual rainfall at the station X , A , B & C are respectively 770 mm, 882 mm, 736 mm and 944 mm. Estimate the missing storm rainfall at station X . 7
- (d) Write short notes on : (any two) 7
- (i) Double-mass curve

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- (ii) Probable maximum precipitation
- (iii) Presentation of rainfall data

Unit-III

3. (a) Define Infiltration. 2
- (b) Explain briefly ϕ -index and w -index. 7
- (c) Discuss the factor which effect infiltration process on a catchment. 7
- (d) A 6 h storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/h in successive σ hour interval over a basin of 800 sq.km. The resulting runoff is observed to be 2640 hectares meter. Determine ϕ -index for the basin. 7

Unit-IV

4. (a) What is unit hydrograph? 2
- (b) Briefly explain S-curve hydrograph with well-labelled diagram. 7
- (c) Describe any two methods of separating the baseflow from the total runoff. 7

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- (d) The ordination of a 3 hour unit hydrograph are given below. Find the ordinates of 6 hour unit hydrograph for this basin : 7

Time (hr)	W.H.O. m ³ /s
0	0
3	10
6	25
9	20
12	16
15	12
18	9
21	7
24	5
27	3
30	0

Unit-V

5. (a) Define Aquifer. 2
 (b) Explain pumping test and recuperation test. 7
 (c) Describe in brief the occurrence of ground water with neat sketch. 7
 (d) A 30 cm well completely penetrates an unconfined aquifer of saturated depth 40 m. After a long period

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of pumping at a steady rate of 1500 lpm, the draw down in two observation wells of 25 and 75 m from pumping well were found to be 3.5 and 2 m respectively. Determine the transmissivity of aquifer? What is draw down at pumping well? 7