

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**  
**SECOND SEMESTER 2021-2022**

**MID SEMESTER EXAMINATION-ENGINEERING HYDROLOGY (CLOSE BOOK)**

Course No: CE F321

Duration: 90 min (2:00 – 3:30 PM)

Date: 15-03-2022 (Tuesday)

Max. Marks: 60

**Instructions:**

1. Show all calculations/steps in detail. No marks will be awarded for correct answers without proper calculations
2. Read question carefully and express the answers only in the units you are instructed to use
3. Use graph paper wherever necessary and sharing of calculators is not allowed

**Q.1. Answer the following in the form of a short paragraph/points:**

**[2 x 5 = 10 M]**

- a. Please list the storage and transportation components of a hydrologic cycle.
- b. Differentiate between phi index and w index. Also mention respective equations.
- c. Why do we represent precipitation in 'depth' units instead of 'volumetric' units? Explain with the help of an example.
- d. What do you mean by 80% dependable yield or runoff volume?
- e. What is ADCP and how it works?

**Q.2.**

a. Hydrologists in the southern India examined an area of 1235.53 acres and found predominance of non-black cotton soil and  $CN_2$  has been established as 68. (a) If the total rainfall in the past five days is 25 cm and the season is dormant season, estimate the runoff volume due to 80 mm of rainfall in a day? (b) What would be the runoff volume if the rainfall in the past five days were 35 mm? Please express both answers in  $m^3$  units only.

**[7 M]**

b. Estimate  $CN_1$ ,  $CN_2$  and  $CN_3$  for a catchment with following land use.

**[3 M]**

Land use	Soil group C (%)	Soil group D (%)	Total % area
Cultivated land (Paddy)	30	45	75
Scrub forest	6	4	10
Waste land	9	6	15

**Q.3. There is an isolated 3-h storm which occurred over a basin in the following fashion:**

**[10 M]**

% of catchment area	Phi index (cm/h)	Rainfall (cm)		
		1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour
20	1.00	0.8	2.3	1.5
30	0.75	0.7	2.1	1.0
50	0.50	1.0	2.5	0.8

Estimate the runoff from the catchment due to the storm. Express your answer in depth (cm) units only.

**Q.4. Write Horton's equation for determining the infiltration and mention the meaning of each parameter in the equation. Mention the names of any two other equations used for determining infiltration. Table below shows the infiltration data obtained using double ring infiltrometer. Determine the best values of the parameters of Horton's infiltration capacity equation. All answers concerning infiltration capacities should be expressed in cm/h only. Ignore any observational errors while plotting the graph. Take  $f_c = 1.5$  cm/h** **[10 M]**

# F321 June 13 Question Paper

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Hills (Vocal Score). German Edition. John Tavener: I Will Lift Up Mine Eyes Unto The Hills (Vocal Score). I Will Lift My Eyes - Full Score and Parts Vocal Forces: SATB, Cantor, Solo, Assembly. Accompaniment: Keyboard. Guitar: Yes. Instrumental parts included: C Instrument, Flute I, Flute II, Oboe, ... I Will Lift up Mine Eyes - Marzo, Eduardo Jul 5, 2014 — Marzo, Eduardo - I Will Lift up Mine Eyes Psalm 121. Voice High and ... "For over 20 years we have provided legal access to free sheet music. I Will Lift Up Mine Eyes (Sowerby, Leo) [7 more...]

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