

B.Tech 5th Semester Exam., 2015

ENGINEERING HYDROLOGY

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Write on any seven from the following in short preferably 1 or 2 sentence(s) each : 14

- (a) Infiltration
- (b) Infiltration rate
- (c) Precipitation
- (d) Saturation pressure
- (e) Runoff
- (f) Zone of saturation
- (g) Flood stage ✓
- (h) Zone of aeration ✓
- (i) Capillary fringe ✓

2. (a) Write about the factors affecting infiltration capacity. 6

(b) The infiltration capacities of an area at different intervals of time are indicated below :

Time (in hours)	:	0	0.25	0.50	0.75	1.00
Infiltration capacity (f) (in cm/hr)	:	10.4	5.6	3.2	2.1	1.5

Time (in hours)	:	1.25	1.50	1.75	2.10
Infiltration capacity, f (in cm/hr)	:	1.2	1.1	1.0	1.0

Find an equation for the infiltration capacity in the exponential form. 8

3. (a) Write about the types of precipitation. 6

(b) Write about the runoff process. 8

4. (a) Write about the characteristics of precipitation. 6

(b) The following are the rates of rainfall for successive 20 minutes period of a 140-minute storm :

2.5, 2.5, 10.0, 7.5, 1.25, 1.25, 5.0 cm/hr

Taking the value of ϕ index as 3.2 cm/hr, find out the net runoff in cm, the total rainfall and the value of w index. 8

5. (a) Write about the drainage of groundwater. 6

(b) Write about the groundwater yield. 8

6. (a) Write about the causes of flood. 6

(b) Write about the design flood and its importance. 8

7. (a) Write about estimating design flood and flood flows. 6

(b) Write about the determination of flood by using empirical formula. 8

8. (a) Write about the fundamental equation for runoff computation. 6

(b) How will you prepare a unit hydrograph from an isolated storm? 8

9. Write short notes on any three of the following : 14

(a) Infiltration capacity

(b) Field capacity

(c) Rain intensity

(d) Rainfall distribution

(e) Soil moisture deficiency
