Code : 011512

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 :

(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

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