Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91264

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Sixth Semester
Civil Engineering
CE6001 – HYDROLOGY
(Regulations 2013)
(Also Common to PTCE 6001 – Hydrology for B.E. (Part-Time) Fifth Semester Civil Engineering – Regulations 2014)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. How do you get hydrological data in India ?
2. Differentiate between rain and drizzle.
3. What are the analytical methods for determining lake evaporation ?
4. What is effective rainfall ?
5. What is time base of unit hydrograph ?
6. Under what situations a synthetic unit hydrograph is used ?
7. Differentiate between reservoir routing and channel routing.
8. Define probable maximum flood.
9. Differentiate between effluent streams and influent streams.
10. What is radius of influence of a well ?

PART – B **(5×13=65 Marks)**

11. a) i) Describe the hydrological cycle. Explain the man's interference in various parts of this cycle. **(7)**

ii) Explain the working principle of float type rain gauge with neat diagram. **(6)**

(OR)

b) i) Explain a method for testing the consistency or homogeneity of precipitation data. (6)

ii) Write short note on intensity-duration-frequency curves and depth-area-duration curves. (7)

12. a) Define Pan Coefficient. List the different types of evaporimeters and write in detail about ISI Evaporation Pan.

(OR)

b) i) The total observed runoff volume during a six hours storm with a uniform intensity of 1.5 cm/h is 21.6×10^6 m^3. If the area of the basin is 300 km^2, find the average infiltration rate for the basin. (5)

ii) A 7-h storm produced the rainfall intensities (mm/h) at half an hour intervals over a basin of area 1830 km^2. Rainfall intensities are 4, 9, 20, 18, 13, 11, 12, 2, 8, 6, 17, 13, 6, 1. If the corresponding observed runoff is 36.6 million m^3, estimate ∅-index for the basin. (8)

13. a) The ordinates of a 4 h unit hydrograph are given below. Determine the ordinates of a 12 h unit hydrograph.

Time (hour)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate in m^3/sec	0	20	80	130	150	130	90	52	27	15	5	0

(OR)

b) Explain a procedure of deriving a synthetic unit hydrograph for a catchment by using Snyder's method.

14. a) Write the name of primary equations that can be used in hydrological routing and explain about it. (13)

(OR)

b) Discuss about the various structural methods and non structural methods that can be employed for controlling floods. (13)

15. a) i) With neat sketches explain briefly about confined aquifer, unconfined aquifer and perched water table. (5)

ii) Derive an expression to determine the steady state discharge of a confined aquifer. (8)

(OR)

b) i) Write short notes on pumping test and recuperation test. **(5)**

ii) A 45 cm diameter well penetrates an unconfined aquifer of saturated thickness 30 m completely. Under a steady pumping rate for a long time the drawdowns at two observation wells 15 m and 30 m from the well are 5.0 m and 4.2 m respectively. If the permeability of the aquifer is 20 m/day, determine the discharge and the drawdown at the pumping well. **(8)**

PART – C **(1×15=15 Marks)**

16. a) Two catchments A and B are considered meteorologically similar. Their catchment characteristics are given below.

Catchment A	Catchment B
L = 30 km	L = 45 km
L_{ca} = 15 km	L_{ca} = 25 km
A = 250 km^2	A = 400 km^2

From Catchment A, a 2 hour unit hydrography was developed and was found to have a peak discharge of 50 m^3/sec. The time to peak from the beginning of the rainfall excess in this unit hydrograph was 9 hours. Using Snyder's method, develop a unit hydrograph for Catchment B.

(OR)

b) Annual maximum recorded floods in the river for a period 1951 to 1966 is given below. Estimate the flood discharge with recurrence interval of (i) 50 years (ii) 100 years by graphical extrapolation.

Year	1951	1952	1953	1954	1955	1956	1957	1958
Max. Flood (m^3/s)	2947	3521	2399	4124	3496	2947	5060	4903

Year	1959	1960	1961	1962	1963	1964	1965	1966
Max. Flood (m^3/s)	3757	4798	4290	4652	5050	6900	4366	3380