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**B.E. / B.Tech. ( Part Time ) DEGREE ARREAR EXAMINATIONS, NOV / DEC 2013**

**CIVIL ENGINEERING**

**VII Semester**

**PTCE 9306 Hydrology and Water Resources Engineering**

**(Regulation 2009)**

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

**PART- A (10 x 2 = 20 Marks)**

1. List the different forms of water concerning the study of hydrology.
2. Differentiate between convective and cyclonic precipitation.
3. State the effect of slope of a drainage basin on runoff.
4. What are the assumptions made for the unit hydrograph?
5. Give a brief about flood zoning.
6. State any two methods of assessing drought.
7. Differentiate between confined and unconfined aquifers.
8. Write Theis equation and give its application.
9. Define trap efficiency.
10. Compare and contrast a gravity dam with an arch dam.

**Part – B ( 5 x 16 = 80 marks)**

11. (i) A fully penetrating well having a diameter 30 cm draws water from a confined aquifer of permeability  $10^{-3}$  m/s and thickness of 15m. If steady state discharge is found to be  $1/30$  m<sup>3</sup>/s, compute the drawdown at points 15m and 45m from the centre of the well. Radius of influence is 1000m. (8)  
(ii) Explain the GEC norms of groundwater estimation. (8)
12. a) (i) Describe how the Lysimeter is used to determine the evapotranspiration from a cultivated land. (8)  
(ii) Discuss on the factors affecting evaporation. (8)

**(OR)**

- b) (i) The data pertaining to a rainfall intensity graph given below shows a 60 minute rain that fell in a catchment of 1500 ha. The average infiltration capacity of the catchment was found to be 1.5 cm/hr during the entire period of the rain. Find the maximum runoff rate if the peak percentage

based on 20 minutes interval from a distribution graph of a similar catchment was found to be 20%. (8)

Time (minutes)	10	20	30	40	50	60
Rainfall Intensity (cm/hr)	2.0	4.0	5.3	3.5	3.5	1.7

(ii) Describe the procedure of using a double ring infiltrometer for getting an infiltration capacity curve. (8)

13. a) (i) Elaborate on the SCS method of establishing the rainfall-runoff relationship. (8)

(ii) The ordinates at hourly interval for a one-hour unit hydrograph corresponding to 1 cm effective rainfall of one hour duration are given below. Compute the total runoff hydrograph resulting from a 2 hour storm rainfall with effective rainfall in the first hour of 2 cm and in the second hour of 1 cm, assuming a constant base flow of 20 cumecs. (8)

Time (hr)	0	1	2	3	4	5	6	7	8	9	10	11	12
UHO (m <sup>3</sup> /s)	0	660	1140	840	590	390	240	150	90	50	25	10	0

(OR)

b) Compute the stream flow from the data given below. (16)

Distance (m)	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.14	
Depth (m)	0	0.3	1.29	2.16	2.55	2.22	1.68	1.41	1.05	0.63	
Velocity (m/s)	0.2d	0	1.42	0.57	0.78	0.87	0.81	0.75	0.69	0.63	0.54
	0.8d	0	0.21	0.36	0.54	0.60	0.30	0.51	0.45	0.39	0.33

14. a) Draw the classification tree of reservoirs and explain them bringing out their advantages and disadvantages. (16)

(OR)

b) (i) Explain with a neat sketch the zones of a reservoir. (8)  
(ii) Elaborate on reservoir sedimentation. (8)

15. a) Explain the different methods available for the estimation of the flood. (16)  
(OR)

b) Write short notes on

- (i) Inter-Basin transfer of rivers (8)  
(ii) Rain water harvesting method for urban areas. (8)