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**B.E ( Full Time ) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014**

**AGRICULTURAL AND IRRIGATION ENGINEERING**

Semester - IV

**AI 8452 Hydrology and Water Resources Engineering**

(Regulation R2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

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

1. Define rainfall hyetograph
2. An anemometer 10m above the ground recorded a wind velocity of 5.0m/s. What is the estimated wind velocity at 5m above the surface?
3. Sketch the schematic representation of the total runoff process
4. Define Unit Hydrograph with its basic assumptions
5. Classify the reservoir based on the Water quality
6. Define Trap efficiency
7. Differentiate SPF and PMF
8. How drought differs from other natural hazards
9. Define Darcy's law
10. What do you mean by Specific yield and Specific retention

**Part – B ( 5 x 16 = 80 marks)**

11. (i) Write short notes on the double mass curve (6)  
(ii) Explain briefly about the types of the recording rain gauges (10)
12. a) Explain briefly about both the direct and indirect methods of stream flow measurements (16)  

**(OR)**

b) From the topographical map of a drainage basin the following quantities are measured  $A = 3480 \text{ km}^2$ ,  $L = 148 \text{ km}$  and  $L_c = 74 \text{ km}$ . The 12 h unit hydrograph derived for the basin has a peak ordinate of  $155 \text{ m}^3/\text{s}$  occurring at 40h. Determine the coefficients  $C_t$  and  $C_p$  for the synthetic unit hydrograph of the basin. With the estimated coefficients, compute a 4h synthetic unit hydrograph for the sub basin having the drainage area of  $2500 \text{ km}^2$  with  $L = 100\text{km}$  and  $L_c = 50\text{km}$  which is a sub basin of the drainage basin (16)
13. a) Write notes on the Structural and Non-Structural measures adopted for flood events (16)  

**(OR)**

b) Explain briefly about the different methods of analysis of the hydrological drought(16)

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14. a) (i) Explain briefly about the different storage zones of the reservoir (8)  
(ii) Write notes on the methods adopted to determine the reservoir storage capacity (8)

(OR)

- b) (i) Describe briefly about the control of the reservoir sedimentation with the preventive measures adopted (10)  
(ii) Write short notes on the reservoir sedimentation with different types of the sediment loads (6)

15. a) (i) It was observed in a field test that 5hr was required for a tracer to travel from one well to another which is 30 m apart and the difference in the water surface elevations are 50cm. Samples of the aquifer between the wells indicated a porosity of 15%. Determine the permeability of the aquifer, seepage velocity, actual velocity and the Reynolds number for the flow by assuming average size of the grain as 1mm and kinematic viscosity as 0.008 Stoke (10)  
(ii) A 30 cm well yielding 300lpm under a drawdown of 2m penetrates an aquifer 35m thick. For the same drawdown what would be the probable yield of a) 20 cm well, b) 40 cm well? Assume a radius of influence of 500 m in all cases (6)

(OR)

- b) Explain briefly about the Rain water harvesting structures in rural and urban areas (16)