**[5253] - 501**

## T.E. (Civil) (End Sem.)
## HYDROLOGY & WATER RESOURCE ENGINEERING
## (2015 Pattern)

*Time :2½ hours]* [Max. Marks :70

*Instructions to the candidates:*

1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8 and Q9 or Q10.*
2) *Figures to right indicates full marks.*

**Q1)** a) Explain Application of Hydrology. **[5]**

b) State deltas for gram, maize, sugarcane, rice and cotton also explain methods to improve duty. **[5]**

OR

**Q2)** a) State the formula to calculate optimum number of rainguages. Explain the different terms in formula. **[5]**

b) Differentiate between sub-surface irrigation and sprinkler irrigation. **[5]**

**Q3)** a) Derive the formula to calculate discharge of a well in a confined aquifer.**[5]**

b) State various types of tube well. Explain Any one in detail. **[5]**

OR

**Q4)** a) Determine the capacity of reservoir from the following data. The CCA is 80000 hectares. Assume canal and reservoir losses as 5% and 10% respectively.

| Crop | Base period (days) | Duty (hect/cumecs) | Intensity of irrigation (%) |
|------|--------------------|--------------------|------------------------------|
| Rice | 120 | 1800 | 25 |
| Wheat | 150 | 2000 | 30 |
| Sugarcane | 320 | 2500 | 20 |

**[6]**

b) Explain the following. **[4]**

i) Aquifer　　　　　　　　ii) Aquiclude

iii) Specific Yield of an Aquifer　　iv) Porosity of soil

*Q5)* a) The ordinate of 6 h unit hydrograph are given below: **[10]**

| Time (h) | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ordinate of 6 h UH ($m^3$/s) | 0 | 20 | 60 | 150 | 120 | 90 | 66 | 50 | 32 | 20 | 10 | 0 |

It two storms, each of 1- cm excess rainfall and 6 h duration occurs in succession, calculate the resulting hydrograph of flow. Assume base flow to be $10 m^3$/s.

b) What is unit Hydrograph? Draw a single peaked hydrograph showing its all components. Also state the uses of hydrograph. **[8]**

**OR**

*Q6)* a) What is S curve Hydrograph? Explain its construction with sketch. **[9]**

b) Explain Gumbels flood frequency analysis method. **[9]**

*Q7)* a) Explain how will you fix the capacity of the reservoir using annual inflow and outflow. **[8]**

b) Explain fixation of reservoir capacity using elevation capacity curve and dependable yield. **[8]**

**OR**

*Q8)* a) What are various reservoir losses? Explain various measures to control these losses. **[8]**

b) What is reservoir sedimentation? What is significance of trap efficiency? Explain with neat sketches. **[8]**

*Q9)* a) Write a short note on ancient system of water distribution which still exist in North Maharashtra. **[8]**

b) Explain Global Water Partnership (GWP). **[8]**

**OR**

*Q10)* a) What is water logging? Explain tile drain formule and also state formule for spacing of tile drain. **[8]**

b) Draw a neat sketch for lift irrigation scheme and state various components of lift irrigation scheme. Explain various design steps in lift irrigation system. **[8]**

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