

## CIVIL ENGINEERING COURSE—SECTION IV.

Hydraulic Engineering .....Marks, 1,100.

(A)—*Water Supply; Storage Evaporations, Flow through Orifices and through Pipes under Pressure.*

Marks—Examinations, 500.

INTRODUCTION:—Necessity of Public Water Supplies; Physiological Office of Water; Sanitary Office of Water Supply.

*Consumption.*

Quantity of water required.  
 Statistics of consumption.  
 Ancient cities; European cities; American cities.  
 Increasing consumption.  
 Relations of supply *per capita* to total population.  
 Monthly and hourly variations in the draught.  
 Ratio of monthly consumption.  
 Reserve for fire purposes.

*Rainfall.*

The liquid and gaseous successions.  
 General rainfall statistics.  
 Climatic effects—sections of maximum rainfall.  
 American western rain system.  
 American central rain system.  
 American eastern coast rain system.  
 Influence of elevation on precipitation.  
 River basin rains.  
 Grouped rainfall statistics.  
 Monthly fluctuations of rainfall.  
 Secular do do  
 Local physical influences.  
 Uniform effects of natural laws.  
 Great rainfalls.  
 Maximum ratios of floods to rainfalls.  
 Volume of water from given rainfalls.  
 Gauging rainfalls.

*Flow of Stream.*

Flood volumes inversely as the areas of basins.  
 Formulas for flood volumes.  
 Tables of do do  
 Seasons of floods.  
 Influence of absorption and evaporation upon flow.  
 Flow in seasons of minimum rainfall.  
 Summaries of monthly flow statistics.  
 Minimum mean and flood flow of streams.  
 Ratios of monthly flow of streams.  
 Mean annual flow of streams.  
 Tables of flow, equivalent to given depths of rain.

*Storage and Evaporation.*

Artificial storage.  
 Losses incident to storage.