

**B.TECH SEM – VII (2007 COURSE) (CIVIL ENGG.) : SUMMER -  
2018**

**SUBJECT: ENVIRONMENTAL AND WATER RESOURCES ENGINEERING**

Day: **Friday**  
Date: **25/05/2018**

**S-2018-2759**

Time: **02.30 PM TO 05.30 PM**  
Max. Marks: 80

**N.B:**

- 1) **Q. No.1 and Q. No.5** are **COMPULSORY**. Out of remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Use of non-programmable **CALCULATORE** is allowed.
- 5) Assume suitable data if necessary.

**SECTION-I**

- Q.1** a) Define the terms sludge volume index and sludge bulking. (05)  
b) State advantages and disadvantages of aerated lagoons. (05)  
c) Explain the methods of disposal of septic tank effluent. (04)
- Q.2** a) Explain different tricking filter media and their characteristics. (06)  
b) Explain biological principle and modifications of activated sludge process. (07)
- Q.3** a) What are aerated lagoons? Explain the principle and aeration method. (06)  
b) Explain design of oxidation ponds and method of disposal of pond effluents. (07)
- Q.4** a) Explain the design of anaerobic digesters and factors governing anaerobic digestion. (06)  
b) Explain with flow sheet the treatment process of sugar industry waste water. (07)

**SECTION-II**

- Q.5** a) With the help of neat sketch explain various elements of hydrological cycle. (05)  
b) Explain slope area method of stream flow measurement. (05)  
c) Explain any four important factors affecting duty of water. (04)
- Q.6** a) Define  $\Phi$  index and W-index. Explain the procedure to obtain  $\Phi$  index of the catchment. (06)  
b) State various factors affecting rate of evaporation and state various method to reduce the evaporation loss. (07)
- Q.7** a) Explain area velocity method of stream flow measurement (06)  
b) Two storms each of 6hr duration and having rainfall excess of 3.4cm and 4.6cm occur successively. The 4.6cm rain follows 3.4cm rain. The 6hr. Unit hydrograph of the catchment is as given below. Calculate the ordinates of resulting direct run off hydrograph due to combined effect of both the storms. (07)

Time hr.	0	6	12	18	24	30	36	42	54	60
Ordinates of 6 hr UH.m <sup>3</sup> /s.	0	30	75	160	140	80	60	40	20	0

- Q.8** a) Explain the following terms: (06)  
i) Confined aquifer    ii) Unconfined aquifer    iii) Aquiclude  
b) Derive the discharge equation for a well penetrating a confined aquifer under steady flow condition. (07)

\* \* \* \* \*