

B.TECH SEM – VIII (2007 COURSE) (CIVIL ENGG.) :

WINTER - 2017

SUBJECT : WATER RESOURCES ENGINEERING – II

Day : **Tuesday**
Date : **21/11/2017**

Time **02.30 PM TO 05.30 PM**

Max. Marks : 80

W-2017-2649

N.B.:

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

SECTION – I

- Q.1** a) With the help of neat sketch explain various storage zones in a reservoir. [05]
b) State various points to be considered while selecting a dam site. [05]
c) State basic design considerations for design of a section of earth dam. [04]
- Q.2** a) Explain in detail the investigations for reservoir planning. [07]
b) What is trap efficiency? Explain the procedure to determine life of a reservoir knowing trap efficiency and inflow/capacity ratio. [06]
- Q.3** a) What is elementary profile of a gravity dam? Derive the equation for base width of elementary profile for “No tension and No sliding” condition. [06]
b) Explain the computation of earthquake forces and uplift force on a gravity dam. [07]
- Q.4** a) Draw a labeled section of a zoned type of earth dam and state functions of each component. [06]
b) What are the critical conditions for stability of side slopes of an earth dam? Derive the formula for factor of safety of stability of sides slopes. [07]

SECTION – II

- Q.5** a) Explain with neat sketch hydraulic jump type of energy dissipater below spillway. [05]
b) Explain different types of canal linings. [05]
c) State objectives of river training works. [04]
- Q.6** a) A spillway consists of 5 spans of 12m width each with piers and abutments at ends. Determine the discharging capacity of spillway using following data: [07]
i) Maximum reservoir level = 450m
ii) Spillway crest level = 446 m
iii) River bed level = 400 m
iv) Pier contraction coefficient = 0.05
v) Abutment contraction coefficient = 0.1
vi) Coefficient of discharge = 2.2
b) Explain with a sketch Bligh’s creep theory of design of weirs on permeable foundations. [06]
- Q.7** a) Design a stable channel to carry discharge of 30m³/s having bed material of size 0.3mm. Use Lacey’s theory. [07]
b) With the help of neat sketch explain aqueduct and siphon type of cross drainage work. [06]
- Q.8** a) Draw a labeled sketch of high head hydropower plant and state function of each component. [07]
b) What is a flow duration curve? Explain its use in hydropower generation. [06]