Printed Pages: 4 **NEV-603**

(Following Paper ID and Roll No. to be filled in your Answer Books)	
Paper ID : 121613	**Roll No.**

B.TECH.

Theory Examination (Semester-VI) 2015-16

WATER RESOURCE ENGINEERING

Time : 3 Hours ***Max. Marks : 100***

Section-A

1. Attempt all parts. All parts carry equal marks.

Write answer of each part in short. (2×10=20)

(a) Sequence the steps in water resource planning.

(b) Water resource management is necessary. Justify.

(c) Identify evaporation and seepage losses in canals.

(d) Can a waterlogged land be made useful for cultivation?

(e) What is crop rotation?

(f) How to find irrigation efficiency?

(g) Classify canal outlets.

(h) Define meandering.

(i) When does a homogeneous earth dam will be built?

(j) Distinguish between a low gravity dam and high gravity dam.

Section-B

2. Attempt any five parts of the following. (10×5=50)

(a) (i) Briefly discuss about economics of water resource planning.

(ii) Elucidate different objectives of water resource planning.

(b) For a particular watershed, the observed runoff volume and the corresponding peak discharges, Q_1, are shown below.

Qp (m3/s)	0.42	0.12	0.58	0.28	0.66
Runoff (cm)	1.28	0.40	2.29	1.42	3.19

(i) Determine the coeffecients (a and b) in the equation $Q_p = a \times RO^b$ using the least-squares method where Q_p = peak discharge, RO = runoff volume, and a, b = coefficients.

(ii) Estimate the peak discharge for the runoff volume of 4 cm.

(c) An irrigation canal has been designed to have hydraulic radius equal to 2.5 m, depth of flow equal to 2.8 m, and bed slope equal to 1.5×10^{-4}. The sediment on the canal bed has median size of 0.25 mm. Find

(i) The bed condition that may be expected.

(ii) Height and length of bed forms.

(iii) The advance velocity of the bed forms.

(d) What are the main crop seasons of India? Describe the detailed weather conditions for these seasons.

(e) Describe the following river training methods:

(i) Spurs

(ii) Guide banks

(iii) Bank Protection

(f) Elaborate types of canal regulation works and their functional aspects.

(g) Summarize the critical conditions for the stability of an earth dam.

(h) Mention different forces acting on gravity dams and explain them in detail.

Section-C

Note: Attempt any two parts of the following. (15×2=30)

3. (a) Assess the surface water resources in India.

(b) Determine the bed load transport in a wide alluvial stream for the following conditions:

Specific gravity of the sediment = 2.65

Depth of flow = 2.5 m

Velocity of flow = 1.5 m/s

Average slope of water surface = 8×10^{-4}

Mean size of sediment = 5 mm

4. (a) Discuss about major and minor irrigation schemes of India.

(b) Illustrate water logging and its causes.

5. (a) Describe different methods of irrigation.

(b) Outline the gravity method for analysis of gravity dams.