Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

PCI5J001

5th Semester Regular / Back Examination 2018-19

WATER RESOURCE ENGINEERING

BRANCH : CIVIL

Time : 3 Hours

Max Marks : 100

Q.CODE : E296

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 **Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) What are the precautions to be taken in selecting a site for the location of a rain gauge?

b) What is an IUH?

c) What are the factors affecting infiltration.

d) Sketch a typical hydrograph resulting from an isolated storm and identify the features of the same.

e) What is the function of current meter?

f) Differentiate between stream flow and runoff.

g) If the conjugate depths before and after the jump are 2 m and 3 m respectively, then the loss of energy in the hydraulic jump will be.

h) What is critical flow in a open channel?

i) Probability of a 10 year flood to occur at least once in the next 4 year is.

j) An open channel carries water with a velocity of 0.605 m/s. If the average bed shear stress is 1.0 N/m^2, the Chezy coefficient C is.

Part- II

Q2 **Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Describe classification of catchment. How would you work out run off at the outlet of a catchment resulting from rainfall over it.

b) What is the condition of a most economical trapezoidal channel section?

c) Explain the procedure for obtaining the stage-discharge relationship of a stream by using the stage- discharge data from a site with permanent control.

d) Describe the principle involved in the measurement of stream flow by dilution method.

e) Describe evapotranspiration. Explain different methods to reduce evaporation losses.

f) Define ϕ index and W index and bring out the difference between them. How is ϕ index determined from the rainfall hyetograph

g) Explain a procedure of deriving a D-h unit hydrograph from the IUH of the catchment

h) What is synthetic hydrograph? What are its characteristics?

i) Describe the Thiessen method of determining average rainfall in a particular catchment area.

j) Explain specific energy with the help of a diagram.

k) What is flood routing. Explain the basic equations used for flood routing

l) Differentiate between reservoir routing and channel routing.

Part-III

Long Answer Type Questions (Answer Any Two out of Four)

Q3 Describe the principle of working of tipping bucket type recording raingauge with a neat sketch. What are its advantages and disadvantages. **(16)**

Q4 During high flood, a river reach of 2.5 km apart had the following information **(16)**

Section 1 (up stream): $A_1 = 250\ m^2$
$P_1 = 80\ m$
$n_1 = 0.032$
R. L. of water =88.10 m

Section 2 (down stream): $A_2 = 240\ m^2$
$P_2 = 76\ m$
$n_2 = 0.028$
R. L. of water =87.6 m

Neglecting any losses, compute flood discharge.

Q5 The ordinates of a 4 h U.H. of a basin of area 200 Km^2 measured at 1 h intervals are 6, 36, 66, 91, 106, 93, 79, 68, 58, 49,41,34,27, 23, 17, 13, 9, 6, 3 and 1.5 m^3/s respectively. Obtain the ordinates of a 3 h U.H. for the basin using the S-curve technique. **(16)**

Q6 What is Hydraulic jump? A hydraulic jump is formed in a 5 m wide rectangular channel carrying a discharge of 20 m^3/s. The pre- jump depth is 0.5 m. Find the post jump depth, post jump Froude number, and energy loss in the jump. **(16)**