

4E1209

Roll No.

Total No of Pages: **3****4E1209****B. Tech. IV - Sem. (Main) Exam., May - 2019****PCC Civil Engineering****4CE4 – 06 Hydraulics Engineering****Time: 3 Hours****Maximum Marks: 120***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL

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PART – A

(Answer should be given up to 25 words only)**[10×2=20]****All questions are compulsory**

- Q.1 Explain distorted model and undistorted model.
- Q.2 Describe in brief Prandtl's mixing length theory.
- Q.3 Describe briefly what do you mean by smooth and rough boundaries.
- Q.4 Discuss Hydraulic Jump.
- Q.5 What are the various losses in Jump?
- Q.6 Explain draft tube with neat sketch.
- Q.7 Explain unit Hydrograph.
- Q.8 Describe various types of aquifers.
- Q.9 Describe various types of canals briefly.
- Q.10 Explain in brief well hydraulics.

PART – B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

- Q.1 A river model is to be constructed to a vertical scale of 1:50 and a horizontal of 1:20. At the design flood discharge of $450\text{m}^3/\text{sec}$, the average width and depth of flow are 60m and 4.2m respectively. Determine the corresponding discharge in model using Reynolds's similarity.
- Q.2 What are various types of similarities?
- Q.3 In a fully rough turbulent flow in a 15cm diameter pipe. The centre line velocity is 2.5m/sec. and the local velocity at mid radius is 2.28m/sec. Find the discharge and the height of the roughness projections.
- Q.4 Describe critical, subcritical and supercritical flow with reference to specific energy curve.
- Q.5 A rectangular channel 2m wide carries discharge of $6\text{m}^3/\text{sec}$. Calculate critical depth and specific energy at this depth.
- Q.6 In a hydraulic jump in rectangular channel, the discharge per unit width is $2.5\text{m}^3/\text{sec}/\text{m}$ and depth before jump is 0.25m. Estimate:
- (a) Sequent depth
 - (b) Energy loss
- Q.7 Explain the mechanism of pelton wheel-turbine with neat sketch.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

- Q.1 Explain centrifugal pump with neat sketch.
 - Q.2 A Trapezoidal Channel is to be designed to convey $50 \text{ m}^3/\text{sec}$. of water at velocity of $2 \text{ m}/\text{sec}$. The bed width to depth ratio is 8 and side slope is 1 horizontal to 1 vertical. It is lined with material having $n = 0.2$. Calculate bed width, depth of flow and slope of channel. <http://rtuonline.com>
 - Q.3 Describe the design steps of channels according to Kennedy's Theory.
 - Q.4 What is runoff? Explain how will you determine runoff.
 - Q.5 Describe Hydrological cycle with neat sketch.
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