

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-VI Semester (CE)

COURSE CODE (CREDITS):18B1WCE639

MAX. MARKS: 25

COURSE NAME: Open Channel Flow and Hydraulic Machine

COURSE INSTRUCTORS: Ashish Kumar

MAX. TIME: 1 Hour 30 Min

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of scientific calculator is allowed.

Q.No	Question	CO	Marks																
Q1(a)	Explain the term specific energy and specific energy curve? Explain the use of this concept in open channel flow.	2	3																
Q1(b)	Find the specific energy of flowing water through a rectangular channel of width 5 m when the discharge is $10 \text{ m}^3/\text{s}$ and depth of water is 3 m.	2	2																
Q2 (b)	Explain the phenomenon of hydraulic jump in open channel flow with suitable example.	2	2																
Q2 (b)	A sluice gate discharges water into a horizontal rectangular channel with velocity of 6 m/s and depth of flow is 0.4 m. The width of channel is 8 m. Determine whether hydraulic jump will occur or not?	2	2																
Q3 (a)	Explain the stage hydrograph. What are the uses of this hydrograph?	3	1																
Q3 (b)	A current meter was used to measure the point velocity in the centre line of river across the depth of flow of river. The velocity measured are shown as per details in table below. If the average cross-sectional area of the river is 32.5 m^2, compute the discharge of the river. Take depth of river 3.0 m. <table><tr><td>Depth from bottom of channel (m)</td><td>0</td><td>0.5</td><td>1.0</td><td>1.5</td><td>2.0</td><td>2.5</td><td>3.0</td></tr><tr><td>Point Velocity (m/s)</td><td>0</td><td>0.5</td><td>1.25</td><td>1.75</td><td>1.85</td><td>1.87</td><td>1.9</td></tr></table>	Depth from bottom of channel (m)	0	0.5	1.0	1.5	2.0	2.5	3.0	Point Velocity (m/s)	0	0.5	1.25	1.75	1.85	1.87	1.9	3	5
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Q4 (a)	Differentiate between notches and weirs. For what purposes these are used in small channels?	3	2																
Q4 (b)	Determine the height of rectangular weir of length 6 m to be built across a rectangular channel. The maximum depth of water in the channel on the upstream of weir is 1.8 m and discharge is $2 \text{ m}^3/\text{s}$. Take $C_d = 0.6$.	3	4																
Q5	Find the velocity of flow and rate of flow water through a rectangular channel of 6 m wide and 3 m deep, when it is running full. The channel is having bed slope as 1 in 2000. Take Chezy's coefficient $C = 55$	1	4																