JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech-VI Semester (CE)

COURSE CODE (CREDITS):18B1WCE639

MAX. MARKS: 35

COURSE NAME: Open Channel Flow and Hydraulic Machine

COURSE INSTRUCTORS: Ashish Kumar

MAX. TIME: 2 Hours

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	Explain the principle and working od a single acting reciprocating pump with neat sketch. Why flow is not continuous and uniform in these type of pump?	5	5
Q2	Two geometrically similar pumps are running at the same speed of 1000 rpm. One pump has the impeller diameter of 0.3 m and lifts water at the rate of 0.04 m³/s against the head of 15 m. Determine the head and impeller diameter of the pump to deliver the discharge of 0.01 m³/s.	5	5
Q3	Explain the phenomenon of cavitation with precaution and effects. Which types of turbines faces the problems of cavitation?	4	5
Q4	Explain the working of pelton wheel turbine with neat sketch	4	4
Q5	A pelton wheel is to be designed for the following specifications: Shaft power 11,772 kw; head 380m; speed 750 rpm; overall efficiency 86%; jet diameter not to be exceed one sixth of the wheel diameter. Determine (i) the wheel diameter (ii) number of jet required (iii) diameter of the jet. Take coefficient of velocity $C_v = 0.90$ and speed ratio = 0.45	4	6
Q6	A flow of water 0.1 m³/s flows down in a rectangular flume of width 600 mm and having adjustable bottom slope. If Chezy's constant C is 56, find the bottom slope necessary for uniform flow with a depth of flow of 300 mm. Also find the conveyance K of the flume.	2	5
Q7 (a)	Name the different devices used for flow measurement in a river/stream.	3	1
Q7 (b)	A triangular notch was fixed to measure the discharge of a small stream having notch angle 60°. If head over the V notch is 0.3. Compute the discharge of the stream. Take $C_d = 0.6$	3	4