

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December-2018

B.Tech VII Semester

COURSE CODE: 10B1W CE732

MAX. MARKS:35

COURSE NAME: Hydropower Engineering

COURSE CREDITS: 3

MAX. TIME: Two Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required.

- Q1.** Explain the phenomenon of cavitation in hydraulic turbines. Give necessary precautions to avoid condition of cavitation. [5]
- Q2.** Explain the working of reciprocating pump with neat sketch. [5]
- Q3.** Explain the following in brief: [5]
- (a) Priming of centrifugal pump
 - (b) Function of breaking jet, casing and flow regulating arrangement in pelton wheel turbine
- Q4.** Derive the expression for minimum speed required to start a centrifugal pump. [5]
- Q5.** A conical draft tube having diameter at the inlet as 2.0 m and pressure head of water equal to 3.3 m (absolute). The discharge at the outlet is 25 cumec with a velocity of 1.2 m/sec. if the atmospheric pressure head is 10.3 m and losses between the inlet and outlet of the draft tube is negligible; find the length of the draft tube immersed in the water. Total length of the tube is 6 m. [5]
- Q6.** A Pelton wheel is to be designed for a head of 60 m when running at 200 rpm. The pelton wheel develops 95.6475kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency = 0.85 and co-efficient of the velocity is equal to 0.98. [5]
- Q7.** The internal and external diameters of the impeller of a centrifugal pump are 200 mm and 400 mm respectively. The pump is running at 1200 rpm. The vane angle of the impeller at inlet and outlet are 20 and 30 degree respectively. The water enters the impeller radially and the velocity of flow is constant. Determine the work done by the impeller per unit weight of the water. [5]