JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATION- 2025
B.Tech VII Semester (CS/IT/ECE/BT/BI)

COURSE CODE (CREDITS): 22B1WCE733 (3)　　　　　MAX. MARKS: 35
COURSE NAME: PERENNIAL POWER STRUCTURES
COURSE INSTRUCTOR: DR. NIRAJ SINGH PARIHAR　　　MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) Use of calculator is permitted.

(c) The candidate is allowed to make suitable numeric assumptions wherever required for solving the problem.

Q.No	Question	CO	Marks
Q1	Differentiate between natural and energy resources giving suitable examples. Provide a broad classification of the energy resources through a flow chart and discuss how the elements of nature play a vital role in providing various forms of energy resources.	CO1	8
Q2	a. Calculate the energy equivalent of 100 g of matter. b. Estimate the binding energy corresponding to $_{92}U^{235}$ atom considering masses of proton and neutron as 1.007825 amu and 1.008665 amu respectively and atomic mass of $_{92}U^{235}$ as 235.0439 amu.	CO2,5	6
Q3	The quantity of water available for hydroelectric power station is 250 m^3/sec under a head of 1.6 m. If the speed of the turbine is 50 rpm and its efficiency is 82%, determine the available power and number of turbine units required for a specific speed of 740. Suggest a suitable turbine for the condition with reason.	CO2,3	5
Q4	Discuss at least 5 major challenges faced and the applied solutions during construction of the Three Gorges hydropower project. How do you justify the project advantage over environmental and social impact of the project.	CO4,5	8
Q5	Explain briefly the working mechanism of concentrated solar power system. Discuss the various forms of solar grid systems through representative figures.	CO1,2	8