JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-2 EXAMINATION- FEBRUARY 2024
B.Tech VI Semester (Civil)

COURSE CODE (CREDITS): 18B1WCE639 (3) MAX. MARKS: 25
COURSE NAME: OPEN CHANNEL FLOW AND HYDRAULIC MACHINE
COURSE INSTRUCTOR: NIRAJ SINGH PARIHAR MAX. TIME: 1HR 30 MIN

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required and not provided.*

1. Show the classification (forms) of open channel flow with the help of flow diagram. Discuss the parameters which could define the state of flow in an open channel. **[4]** (CO1)

2. Design the trapezoidal channel as best hydraulic cross-section for discharge of 10 m^3/sec, N=0.014, side slope of 1.5H:1V and bed slope of 0.0004. **[5]** (CO2)

3. In a rectangular flume 1m wide, the water flows at a depth of 1m with a velocity of 1m/sec. Neglecting losses, determine:
   a. Discharge in the flume
   b. State of the flow (with reason)
   c. Comment on the type of flow (Laminar/transition/turbulent) with reason
   d. The elevation of the bed required to make the flow critical.
   e. The reduction in width required to make the flow critical. **[7]** (CO2,3)

4. Determine the dimensions of the irrigation canal with the help of Kennedy's theory for the following data: B/D ratio = 3.7, N= 0.0225, m=1.0 and S= 1/ 4000, side slopes of the channel is ½ H : 1V. Also determine the discharge which will be flowing in the channel. **[4.5]** (CO3)

5. Design a regime channel for a discharge of 50 cumecs and silt factor of 1.1 using Lacey's theory. **[4.5]** (CO3)