Programme: B. Tech

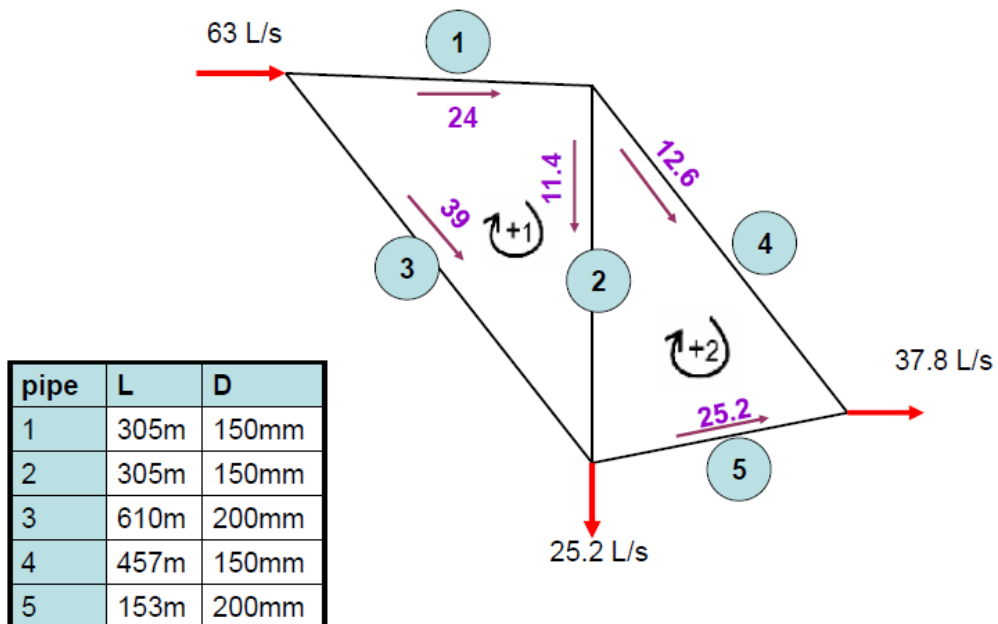**Course Name**: Environmental Engineering - I

Course Code: ECE 358

Tutorial – 5

Topics Covered – Unit 4 (CO4)

Tutorial –5

Assume suitable data wherever necessary

1. Explain in your own words the methodology for assessment of water distribution system using (a) Hardy-Cross Method and (b) Newton- Raphson method (c) comparison of the above methods

2. The hardy-Cross method can be assessed using both (a) Hazen-William Condition and (b) Darcy Weisbach condition. Explain the suitability of both in assessment of WDS.

3. With a neat sketch, explain the functioning of (a) centrifugal pumps and (b) Reciprocating pumps

4. Solve the following pump network using Darcy- Weisbach condition

pipe	L	D
1	305m	150mm
2	305m	150mm
3	610m	200mm
4	457m	150mm
5	153m	200mm

5. Solve the following pump network using Hardy-Cross method (minimum 2 iterations)

Q=80 l/s — D= 30 cm, l= 500 m — 22 l/s

D= 20 cm
l= 300 m

D= 20 cm
l= 300 m

D= 20 cm
l= 500 m

10 l/s
D= 15 cm
l= 300 m

15 l/s
D= 15 cm
l= 300 m

D= 15 cm
l=500 m

9 l/s

24 l/s