**Birzeit University**

 **Mechanical & Mechatronics Engineering Department**

**Heat Transfer ENME 431-2**

**Quiz # 4**

**Instructor: Dr. Afif Akel Hasan 1st. semester 2020/2021**

***Closed book quiz formula sheet is attached***

Water is flowing at a rate of 0. 1 kg/s, in a 10mm square tube 10 m long. Water enters at 20oC while pipe surface is maintained at 80oC. Assume the flowing properties at mean temperature: Cp= 4180 J/kg.K, k= 0.67 W/m.K, µ= 4.2x10-4, Pr = 2.70

1. List assumptions and justify your solution, then calculate average heat transfer coefficient for the tube?[20]
2. Find water temperature at tube exit? [8]
3. Show schematic of surface and water temperature along the pipe. [4]
4. Find rate of heat transfer from tube by two methods [12]
5. Repeat (**a)** above if tube is subject to a uniform flux1000W/m2 along the tube? [6]