

Name: _____

Matric Number: _____

Section / Group: _____

Date of Experiment: _____

EXPERIMENTAL DATA

Air temperature = _____ K

Atmospheric pressure = _____ N/m²

Coefficient of viscosity, μ = _____ kg/ms

Length of plate, L = 0.265 m

Thickness of Pitot Tube, = 0.40 mm

Pressure reading during experiment

Δh_o = _____ mm

P_o = _____ N/m²

Table 1 Pressure Distribution in Boundary Layer on Smooth Flat Plate

Micrometer Reading (mm)	y (mm)	Pressure Head
		Δh (mm)
20.0	10.0	
19.0	9.0	
18.0	8.0	
17.0	7.0	
16.0	6.0	
15.5	5.5	
15.0	5.0	
14.5	4.5	
14.0	4.0	
13.5	3.5	
13.0	3.0	
12.5	2.5	
12.0	2.0	
11.5	1.5	
11.0	1.0	
10.5	0.5	
10.0	0.0	

Table 2 Pressure Distribution in Boundary Layer on Rough Flat Plate

Micrometer Reading (mm)	y (mm)	Pressure Head
		Δh (mm)
20.0	10.0	
19.0	9.0	
18.0	8.0	
17.0	7.0	
16.0	6.0	
15.5	5.5	
15.0	5.0	
14.5	4.5	
14.0	4.0	
13.5	3.5	
13.0	3.0	
12.5	2.5	
12.0	2.0	
11.5	1.5	
11.0	1.0	
10.5	0.5	
10.0	0.0	

EXPERIMENTAL RESULT

Table 3 Velocity Distribution in Boundary Layer on Smooth Flat Plate

Micrometer Reading (mm)	y (mm)	Pressure, P	$\frac{u}{U} = \sqrt{\frac{P}{P_0}}$	$\frac{u}{U} \left(1 - \frac{u}{U}\right)$
		$\rho g \Delta h$ (N/m ²)		
20.0	10.0			
19.0	9.0			
18.0	8.0			
17.0	7.0			
16.0	6.0			
15.5	5.5			
15.0	5.0			
14.5	4.5			
14.0	4.0			
13.5	3.5			
13.0	3.0			
12.5	2.5			
12.0	2.0			
11.5	1.5			
11.0	1.0			
10.5	0.5			
10.0	0.0			

Table 4 Velocity Distribution in Boundary Layer on Rough Flat Plate

Micrometer Reading (mm)	y (mm)	Pressure, P $\rho g \Delta h$ (N/m ²)	$\frac{u}{U} = \sqrt{\frac{P}{P_0}}$	$\frac{u}{U} \left(1 - \frac{u}{U}\right)$
20.0	10.0			
19.0	9.0			
18.0	8.0			
17.0	7.0			
16.0	6.0			
15.5	5.5			
15.0	5.0			
14.5	4.5			
14.0	4.0			
13.5	3.5			
13.0	3.0			
12.5	2.5			
12.0	2.0			
11.5	1.5			
11.0	1.0			
10.5	0.5			
10.0	0.0			

SAMPLE CALCULATION

Show a sample of calculation and attach those with the report.

DISCUSSION

1. Determine values for Re_x , δ^* and θ .
2. Calculate the pressures P_0 and P in N/m², $\frac{u}{U}$ and $\frac{u}{U} \left(1 - \frac{u}{U}\right)$.
3. Plot the velocity distribution of y against $\frac{u}{U}$ for smooth surface and rough surface case in a same graph.
4. Compare the boundary layer thickness for both cases and comment your results.

CONCLUSION

State the conclusions of the experiment based on the understanding from results, graphs and discussions.