EXPERIMENTAL DATA AND RESULTS

Table 1a Data of Aluminum strut

Width, *b* : _____mm	I : _____ m^4
Depth, *d* : _____ mm	E : _____ N/m^2
Length, *L* : _____ mm	

Table 1b Pinned-ends condition (Aluminum strut)

Load, P (N)	Mid-Span Deflection, δ	
	div	mm
40		
60		
80		
100		
120		
140		
160		
180		
200		
220		

Table 1c Fixed-ends condition (Aluminum strut)

Load, P (N)	Mid-Span Deflection, δ	
	div	mm
200		
400		
500		
600		
650		
700		
750		
800		

Table 2a Data of Brass Strut

Width, *b* : _____mm	I : _____ m^4
Depth, *d* : _____ mm	E : _____ N/m^2
Length, *L* : _____ mm	

Table 2b Pinned-ends condition (Brass strut)

Load, P (N)	Mid-Span Deflection, δ	
	Div	mm
50		
100		
150		
180		
210		
240		
270		
300		

Table 2c Fixed-ends condition (Brass strut)

Load, P (N)	Mid-Span Deflection, δ	
	div	mm
300		
600		
800		
1000		
1100		
1150		
1200		
1250		

1. Plot the graph of load (N) versus deflection (mm) for:
   a. Aluminum strut (pinned and fixed end conditions)
   b. Brass strut (pinned and fixed end conditions)
2. From each graph, determine the experimental value of Euler's buckling load.
3. By using equation (11), calculate the theoretical buckling load for each strut to be compared with the experimental results defined previously. Compute the percentage of differences and show in a table (say Table 3) all these results for discussion purpose.

DISCUSSION (N.B. This part of the report must at least describe or discuss the following, but not necessarily limited to those ideas. This must be done in the paragraphs format rather than the points form format)

- Based on the experimental and theoretical results gives your comments on the strut buckling behaviour as observed in this work. Comment on its deviation from the 'idealised' buckling behaviour of the slender strut / column.

- Discuss any possible source of errors that may have affected the outcomes of this experimental work.

CONCLUSION

Give your conclusion and observation of this experimental work.

QUESTIONS

1. "The end conditions of long struts play a dominant role in their load bearing capacity". Discuss this statement giving examples of the critical buckling load for struts with various end conditions.

2. Explain briefly with the help of relevant diagram, the effect of 'eccentricity' of the end centric load on the behaviour of 'pinned end' strut. Indicate how this will modify the 'maximum stress' that will cause such strut to buckle or fail?

3. How the test results would be affected, if the cross-sectional area of the test strut is not uniform or constant? Does this invalidate or contradict with the basic assumptions of the Euler's buckling theory? Justify / support your arguments with the relevant calculation or diagram.