ME 607- Coding Assignment

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Q. Write a code to calculate FPF and LPF of a given laminate with suitable assumptions.

Sol-

Input:

For Nx= 100 N/mm, Ny= Nxy= Mx= My= Mxy= 0

Delta_T= 0

Delta_C= 0

Theta= [0, 45, -45, 90, 90, -45, 45, 0]

Lamina thickness=0.125 mm

Material: Glass-Epoxy

Failure Criterion: Tsai-Hill

Output:

This is a symmetric laminate with 8 plies

For the Layer 1 from top for the iteration 1 Tsai hill equation evaluates to 0.036707116541108725

For the Layer 2 from top for the iteration 1 Tsai hill equation evaluates to 0.5930857616122952

For the Layer 3 from top for the iteration 1 Tsai hill equation evaluates to 0.5930857616122952

For the Layer 4 from top for the iteration 1 Tsai hill equation evaluates to 1.7491725966404592

For the Layer 5 from top for the iteration 1 Tsai hill equation evaluates to 1.7491725966404592

For the Layer 6 from top for the iteration 1 Tsai hill equation evaluates to 0.5930857616122952

For the Layer 7 from top for the iteration 1 Tsai hill equation evaluates to 0.5930857616122952

For the Layer 8 from top for the iteration 1 Tsai hill equation evaluates to 0.036707116541108725

FPF= 75787.52881614 N

For the Layer 1 from top for the iteration 2 Tsai hill equation evaluates to 0.03514882346174952

For the Layer 2 from top for the iteration 2 Tsai hill equation evaluates to 0.34916749856400814

For the Layer 3 from top for the iteration 2 Tsai hill equation evaluates to 0.34916749856400814

For the Layer 4 from top for the iteration 2 Tsai hill equation evaluates to 0.0

For the Layer 5 from top for the iteration 2 Tsai hill equation evaluates to 0.0

For the Layer 6 from top for the iteration 2 Tsai hill equation evaluates to 0.34916749856400814

For the Layer 7 from top for the iteration 2 Tsai hill equation evaluates to 0.34916749856400814

For the Layer 8 from top for the iteration 2 Tsai hill equation evaluates to 0.03514882346174952

For the Layer 1 from top for the iteration 3 Tsai hill equation evaluates to 0.18765987382029778

For the Layer 2 from top for the iteration 3 Tsai hill equation evaluates to 1.864208308251842

For the Layer 3 from top for the iteration 3 Tsai hill equation evaluates to 1.864208308251842

For the Layer 4 from top for the iteration 3 Tsai hill equation evaluates to 0.0

For the Layer 5 from top for the iteration 3 Tsai hill equation evaluates to 0.0

For the Layer 6 from top for the iteration 3 Tsai hill equation evaluates to 1.864208308251842

For the Layer 7 from top for the iteration 3 Tsai hill equation evaluates to 1.864208308251842

For the Layer 8 from top for the iteration 3 Tsai hill equation evaluates to 0.18765987382029778

For the Layer 1 from top for the iteration 4 Tsai hill equation evaluates to 0.43503787556713736

For the Layer 2 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 3 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 4 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 5 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 6 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 7 from top for the iteration 4 Tsai hill equation evaluates to 0.0

For the Layer 8 from top for the iteration 4 Tsai hill equation evaluates to 0.43503787556713736

For the Layer 1 from top for the iteration 5 Tsai hill equation evaluates to 0.9999999999999996

For the Layer 2 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 3 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 4 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 5 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 6 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 7 from top for the iteration 5 Tsai hill equation evaluates to 0.0

For the Layer 8 from top for the iteration 5 Tsai hill equation evaluates to 0.9999999999999996

For the Layer 1 from top for the iteration 6 Tsai hill equation evaluates to 1.0

For the Layer 2 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 3 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 4 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 5 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 6 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 7 from top for the iteration 6 Tsai hill equation evaluates to 0.0

For the Layer 8 from top for the iteration 6 Tsai hill equation evaluates to 1.0

LPF= 265500 N

Order of failure of plies in the laminate from top [4, 5, 2, 3, 6, 7, 1, 8]