

Heat Transfer Questions & Answers

Question by Jaehyuk

Professor, again I have question about A1Q6. Last time, you told me that h_1 is not needed to solve (a) and (b). However, does this also applied to (c) and (d)?

Because h_1 is not given in the question statement, it is not needed to solve the problem. Once (a), (b), (c), and (d) are found, you can find h_1 if you wish, but that is not necessary.

Question by Jaehyuk

Professor, I have a question about contact resistance. As far as I know, when there is a difference in temperature between two surfaces, convection occurs due to circulation of fluid between surfaces. Here starts my question. In the previous class, we did not deal with the convective heat transfer due to filling fluid. Does this convective heat transfer negligible or am I missing any concept?

You can assume the convective heat transfer within the filler fluid to be included within the contact resistance itself (the contact resistance will be smaller in case there is more convective heat transfer).

Question by Student 201428239

Professor, I am confused about Assignment 3, there are two #4 questions. you said do #1, #4, #5. What question should I solve?? Thank you.

I fixed the problem. It should be clear now.

Question by Student 201312147

professor, I did assignment#4, Q7). I solved that Lumped Capacity Analysis. because $Bi=0.073 < 0.1$. so I got the question (a) the answer at 6000s. but, your answer is 5400s. Why is it so different?

Hm, your Biot number is not well calculated.. You shouldn't be using LCA here.

Question by Student 201428239

Professor, I have a question about Design 1 of Questuon #4. Is it fine to use shape factor of hollow cylinder? In the tabel, there is restriction ($L \gg r$). But I think L is

not enough larger than r . Is it correct to use shape factor? Thank you.

Well, you have to make this assumption anyway when solving for the 1D H-T in the fins..

Question by Student 201428239

Professor, I have a question #4 of design 1. Can I use Efficiencies of rectangular fins table?? I think I can't use because it is not insulated tip. I am confused about this.

The efficiency chart in the tables can be used when the tip is not insulated. When the tip is insulated, you can also use the efficiency chart but you need to set $L_c = L$ instead of $L_c = L + t/2$.