Physics/Eng Phys 2H04 - Assignment #3

Due: March 1

Part I: Problems are taken from Stowe

Problem	**8.4**	**3**
	8.12	**3**
	9.5	**7**
	9.8	**3**
	9.16/17	**6**
	9.19	**3**
	9.24	**7**

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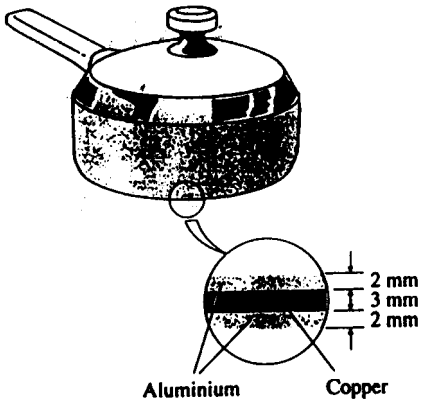
PART II: Additional Problems

A We often turn the fan on in summer to help us cool. Explain how a fan makes us feel cooler in the summer. Also explain why some people use ceiling fans also in winter. (3)

B Consider two walls of a house, which are identical except that one is made of 10-cm-thick wood while the other is made of 25-cm-thick brick. Through which wall will the house lose more heat in winter? (3)

C How does the *R*-value of an insulation differ from its thermal resistance? (3)

D The bottom of a pan is made of a 4-mm-thick aluminum layer. In order to increase the rate of heat transfer through the bottom of the pan; someone proposes a design for the bottom which consists of a 3-mm-thick copper layer sandwiched between two 2-mm-thick aluminum layers. Will the new design conduct heat better? Explain. Assume perfect contact between the layers. (6)



E In the design of electronic components, it is very desirable to attach the electronic circuitry to a substrate material that is very good thermal conductor but also a very effective electrical insulator. If the high cost is not a major concern, what material would you propose for the substrate? (3)