Registration No:

Total Number of Pages :1   **M.TECH**
M.TECH 2ND SEMESTER (AR 18) REGULAR EXAMINATIONS, APRIL/MAY 2019
HEAT EXCHANGER ANALYSIS AND DESIGN
Branch: TE, Subject Code:MTEPE2032

Time: 3 Hours   **Max Marks : 70**

PART-A   **(10 X 2=20 MARKS)**

1. Answer the following questions.
   a) Define Fouling Factor and the factors affecting Resistance and heat Transfer?
   b) What is correction Factor and where it is used?
   c) Differentiate between Regenerative and Recuperative heat exchanger?
   d) What is compact Heat exchanger?
   e) What do you mean by duty of a heat exchanger?
   f) What is Baffles? Why they are used in a Heat exchanger?
   g) How can the flow induced vibration be minimized?
   h) How TEMA charts are are helpful in design of multiple pass heat exchangers?
   i) Explain the physical significance of NTU.
   j) In a cross flow both fluids unmixed has water at 60C flowing at 1.25 kg/s. It is to cool 1.2 kg/s of
       air that is initially at temperature of 50^0C.Calculate NTU & heat capacity ratio. Assume
       $U=130W/m^2K$ and area is $23m^2$.

PART-B   **(5 X 10=50 MARKS)**

Answer any five questions from the following.

Q.2.
a) Show with neat sketch of temperature distribution for unmixed cross flow heat exchanger and explain it.   [5]
b) What are the various sources of a noise in a heat echanger ? How it can be minimized   [5]

Q.3.
Explain how the makeup water requirement is estimated from energy and mass balance of a cooling tower.   [10]

Q.4.
a) Derive the effectiveness of counter flow heat exchanger.   [5]
b) What would be the effectiveness of counter flow heat exchanger if Cmin/Cmax = 0 and Cmin/Cmax=1   [5]

Q.5.
a) What are the causes of development of stress in a heat exchanger and how thermal stress can be   [5]
minimized ?
b) How fouling is dealt while designing heat exchangers.   [5]

Q.6.
Find out an expression of LMTD of a counterflow heat exchanger.   [10]

Q.7.
Write the details of classification of heat exchangers. What are the various type of shell and tube   [10]
arrangement employed?

Q.8. Write short notes on :
 a) Flow pattern of baffles   [5]
 b) Regenerator Vs Recuperaotor   [5]

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