

- 1-Heat exchangers can be classified according to different criteria. List all the criteria for which heat exchangers can be classified into?
- 2-What is the main difference between a recuperator (or recovery) and a generator heat exchanger?
- 3-List two examples of direct contact heat exchangers and draw a sketch for one of them?
- 4-Draw a sketch showing the difference between a disk and drum type regenerator heat exchangers?
- 5-Draw a sketch of double pipe heat exchanger in counter flow arrangement with 5 finned pipes inside?
- 6-List three advantages and three disadvantages of double pipe heat exchangers?
- 7-Draw a sketch of 3 hairpins attached one after the other. What will be the outer heat transfer area in this case in terms of the hairpin length and tube outside diameter?
- 8-What are functions or purposes of baffles in shell and tube heat exchangers?
- 9-What is TEMA stand for? List all TEMA shell types and state the characteristics for each?
- 10-Draw a sketch of shell and tube heat exchanger with one shell pass and two tube passes. Identify: tube sheet, inlet and output ports for the two streams, and baffles?
- 11-Draw sketch of U-tube shell and tube heat exchangers and list its advantages?
- 12-List all types of plate baffles?
- 13-Draw a sketch of pull through shell and tube heat exchanger and state where it can be used?
- 14-Draw a sketch of spiral tube heat exchanger and identify the inlet and outlets of fluids?
- 15-What is the function of gasket in gasketed plate heat exchangers?
- 16-Draw a sketch of gasketed plate heat exchangers showing fluids inlets and outlets. How the heat is transferred between the two fluid streams?
- 17-What are the main advantages and disadvantages of gasketed plate heat exchangers?
- 18-Draw a sketch of spiral plate heat exchangers and list the advantages and disadvantages of this heat exchanger?
- 19-What is a Lamella plate heat exchanger and how it works to transfer heat between hot and cold streams?
- 20-What is meant by compact heat exchangers?

- 21-List five types of fins used in plate-fin heat exchanger? Draw a sketch of one fin type.
- 22-Draw a hand sketch of a typical tube-fin heat exchanger with circular fin on circular pipe. Show the main dimensions and flows inlets and outlets. List two examples for using this heat exchangers.
- 23-Write the expression of Colburn j factor in terms of the following numbers Re (Reynolds), Pr (Prandtl) St (Stanton) and the mass flux rate G. How to get the heat transfer h from this factor?
- 24-Draw a hand sketch of plate-fin heat exchangers. Show the main dimensions and flows inlet and outlets. List two examples for using this heat exchangers.
- 25-Draw the temperature profile for parallel flow heat exchangers for the three cases: $C_c \ll C_h$, $C_c \cong C_h$, $C_c \gg C_h$?
- 26-Draw the temperature profile for counter flow heat exchangers for the three cases: $C_c \ll C_h$, $C_c \cong C_h$, $C_c \gg C_h$?
- 27-Use the internet to search for 2 application examples of shell and tube heat exchangers
- 28-Use the internet to search for 2 application examples of double pipe exchangers
- 29-Use the internet to search for 2 application examples of plate-fin compact heat exchangers
- 30-Use the internet to search for 2 application examples of tube-fin compact heat exchangers
- 31-Use the internet to search for 2 application examples of gasketed plate heat exchangers
- 32-Use the internet to search for 2 application examples of cooling tower heat exchangers