BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
B.Tech.Sem - VII CHEMICAL : WINTER- 2022
SUBJECT : CHEMICAL PROCESS EQUIPMENT DESIGN-II

Day : Wednesday
Time : 02:30 PM-05:30 PM
Date : 07-12-2022
W-13593-2022
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data if **NECESSARY**.
4) Draw neat and labeled diagrams **WHEREVER** necessary.
5) Use of non-programmable **CALCULATOR** is allowed.

Q.1 Design a vertical short tube calendria for an evaporator with reference to diameter of tube sheet and calendria sheet thickness. **(10)**

a) Heat transfer area = 220 m^2
b) Steam pressure = 0.15 N/mm^2
c) Density of liquid = 1000 kg/m^3
d) MOC (tube) = brass
e) Permissible stress for C.S. = 98 N/mm^2
f) Modulus of elasticity (brass) = 9.5×10^4 N/mm^2
g) Viscosity = 0.3
h) Tube dia. (o.d.) = 100 mm
i) Tube thickness = 1.5 mm
j) Tube length = 1165 mm
k) Triangular pitch = 125 mm
l) Proportionality factor $\beta = 0.9$

OR

Q.1 Discuss the salient feature of different types of crystallizers with neat diagram and their working. **(10)**

Q.2 Explain the design procedure with various equations for design of rotary drum vacuum filter, including design of drum, shaft, bearing and drive system. **(10)**

OR

Q.2 Explain various types of continuous dryers with neat sketch and working mechanism. **(10)**

Q.3 Define plate efficiency? How would you design a bubble cap tray column for separation of two components? **(10)**

OR

Q.3 Explain design method for binary system for sieve tray column. **(10)**

Q.4 Write a note on: **(10)**

i) Cornell's method for packed column design
ii) Onda's method for packed column design

OR

Q.4 Explain the design procedure for packed column using HTU, NTU concept. **(10)**

Q.5 Explain various types of piping material and their specification used in chemical process industries. **(10)**

OR

Q.5 Write notes on: **(10)**

i) Pipe fittings
ii) Types of Flanges
iii) Types of Valves

Q.6 What are the various types of pipe supports? Why it is necessary. **(10)**

OR

Q.6 What do you understand by expansion joints in piping system. **(10)**

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