

M.Tech Sem-I (Chemical) 2015 course CBCS: Summer-2018
SUBJECT: MULTIPHASE REACTORS

Day: Monday
Date: 4-6-2018

S-2018-2993

Time: 11:00 A.M. To 2:00 P.M.
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Answer to both the sections should be written in the **SEPARATE** answer book.
- 5) Assume suitable data, if necessary.

SECTION - I

Q.1 Elaborate advantages of mechanically agitated contractor (MAC) over bubble column (BC) with an industrial example. (10)

OR

Q.1 Elaborate flow regimes observed in solid gas fluidized bed (SGFB) as a function of superficial gas velocity. (10)

Q.2 Derive an equation relating standard Gibbs energy change with chemical reaction equilibrium constant. (10)

OR

Q.2 Derive kinetic equation for gas phase catalytic reaction wherein non porous solid phase catalyst is used and surface reaction is rate controlling. (10)

Q.3 Explain physical significance of flow number and power number. (10)

OR

Q.3 Enlist type of impellers and explain flow pattern generated by any two impellers in MAC. (10)

SECTION - II

Q.4 Derive an expression for axial dispersion plug flow model. (10)

OR

Q.4 Explain following in context to mixing (10)
i) Open-open boundary condition
ii) Close – close boundary condition

Q.5 Derive an equation to estimate heat transfer coefficient (HTC) of condensation on vertical plate. (10)

OR

Q.5 Explain effect of system and operating parameters on mass transfer coefficient (MTC) in any multiphase systems with a suitable correlation. (10)

Q.6 Derive Burke - Plummer equation to determine pressure drop in SLFB. (10)

OR

Q.6 Elaborate experimental procedure to compute liquid phase dispersion coefficient in SLFB. (10)

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