

**M. TECH. -IV (CHEMICAL) (2011 COURSE) CHOICE BASED
CREDIT SYSTEM : WINTER - 2017**

SUBJECT : SELF-STUDY PAPER – II: MULTIPHASE REACTORS

Day : **Saturday**
Date : **02/12/2017**

W-2017-3229

Time : **11.00 AM TO 02.00 PM**
Max. Marks : 60—

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Answers to both the sections should be written in **SEPARATE** answer books.
 - 4) Assume suitable data if necessary.
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SECTION – I

Q.1 Explain application of expanded solid – liquid bed for chromatography separation. **[10]**

OR

Explain any one industrial relevant application of bubble column reactor in detail.

Q.2 Explain the role of thermodynamics in solid – liquid equilibrium reaction in detail. **[10]**

OR

Explain an estimation of equilibrium constant for heterogeneous system by defining standard state of the phases involved.

Q.3 Define power number of an impeller. Explain the method of power estimation for homogeneous reaction in MAC. **[10]**

OR

Explain flow patterns developed by pitch blade turbine and hydrofoil impellers. In which case power consumption would be minimum?

SECTION – II

Q.4 Estimate energy dissipation rate in solid – liquid fluidized bed using energy balance approach. **[10]**

OR

Define critical speed of solid suspension in MAC. Explain effect of system and operating parameters on critical speed of solid suspension.

Q.5 Explain solid dissolution method in detail to estimate mass transfer coefficient in multiphase reactors. **[10]**

OR

Explain the effect of axial solid and liquid phase mixing on mass transfer coefficient in detail.

Q.6 Enlist steps to design and develop solid – liquid circulating fluidized bed. **[10]**

OR

Enlist steps to design and develop MAC for homogeneous reactions.

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