Reg. No.



# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

### **VI SEMESTER B.TECH. END SEMESTER MAKEUP EXAMINATIONS 2018**

## SUBJECT: CHEMICAL REACTION ENGINEERING 2 [CHE 3202]

**REVISED CREDIT SYSTEM** 

(18/06/2018)

Time: 3 Hours

#### MAX. MARKS: 50

#### **Instructions to Candidates:**

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitable assumed.

1A.	With a neat	diagram	n explain	and de	erive th	ne relat	ion fo	or segre	gation n	nodel.		05
1B.	A reactor is C 3 t, min 0 Calculate co	used to 5 38 10 onversio	carry ou4040201n assuming	t the re 40 2 30 4 ing a) H	action 39 2 40 5 Plug flo	$\begin{array}{c c} A \rightarrow R \\ \hline 37 & 5 \\ \hline 50 & 6 \\ \hline ow b) N \end{array}$	, -r <sub>A</sub> = 36 60 Mixed	= 0.05C 35 70 flow	A, mol/(	l.min).		05
2A.	For an elem a fraction o is fed to the Data: $\Delta H^{o}_{fa} = -400$ $\Delta H^{o}_{fb} = -60$ $C_{pA} = C_{pB} =$ k = 100000	ientary 1 f temper reactor 000 cal/r 000 cal/r 50 cal/ at 298 F	iquid ph rature. D at tempe nol mol. molK. X.	ase rea Determi prature	ne the of 300	A↔B. adiaba K.	Make	a plot juilibriu	of equil um temp	librium c	onversion as when pure A	06
2B.	Write a note	e on Igni	ition-Ext	inction	tempe	erature	and N	Aultiple	e steady	states		04
3A.	With a near particle (fla	sketch : king) wl	derive t nen gas f	he rela ïlm is t	tion be the rate	etween e contro	time olling	and co step.	onversio	n for sm	all shrinking	06
3B.	A batch of Solid is co (SCM). The 2 hours. De	spherica nverted conver termine	al solids to a fir sion is 8 the rate o	(of sir rm non 7.5% in control	ngle siz flakir n reacti ling mo	ze) is t ng pro ion tim echani	treated duct ne of 1 sm.	d by ga accordi l hour a	ns in a ung to s and conv	iniform e hrinking version is	environment. core model complete in	04
4A.	Calculate the equation and large value) P/Po Vol. adsorbed (cm <sup>3</sup> /g)	ne BET d the or . Are the 0.02 23.0	surface ne-point e values 0.03 25.0	area j BET e same? 0.04 26.5	per gra equatio What i 0.05 27.7	am of on (who is the E 0.1 31.7	solid ere th BET co 0.15 34.2	for a constant 0.2 36.1	sample, tant is a ? ( $\alpha = 0$ . 0.25 37.6	using the source of the second	ne full BET to be a very	06

4B.	Briefly describe multiphase reactors.				
5A.	Find an interim rate expression for the following catalytic reaction when surface reaction is controlling. $A + B \rightarrow M + N.$	06			
5B.	Write a note on promoters and deactivators	04			