

INTERNATIONAL CENTRE FOR APPLIED SCIENCES MAHE, MANIPAL B.Sc. (Applied Sciences) in Engg. End – Semester Theory Examinations – MAY 2021 IV SEMESTER - CHEMICAL REACTION ENGINEERING (ICHM - 241) (BRANCH: CHEMICAL ENGINEERING)

Time: 03 Ho	ours	Date: 12 May 2021							N	Max. Marks: 50			
\checkmark	Answer ALL F Missing data, i	TIVE f any	full (, may	Questio y be sui	ons. itably a	issume	d						
1A	Come up wi the experime	th (g ental	guess ly foi	and th und rat	en ver e equa	ify) a 1 tion fo	nechar r the fo	nism th ollowin	at is c	onsiste tion	ent w	ith (5)	
	$2A + B \rightarrow A$	∆2 B ,	with	+r A ₂ B	= k[A]][B]							
1B	Derive related by pass mode	ionsł el	nip bo	etween	conve	ersion a	and RT	D data	a for d	ead sp	ace a	ind (5)	
2A	The natural uranium is e ground, how of 235 U (ass is present sin 10^8 years.	abur nricl long umir nce i	ndanc ned to g will ng no t can	e of ²³ o 3 ato it take other j decay	⁵ U in m m % at the sar process to form	uraniun nd then nple to ses forn n ²³⁵ U	m is 0. n is sto reach m ²³⁵ U J)? The	79 ato red in the nat I; this i e half-l	m %. I salt mi ural ab s not th ife of ²	If a sa ines un pundan he case ²³⁵ U is	mple nder t nce lev e if ²³ s 7.13	of (5) the vel ¹⁸ U 5 X	
2B	What are shi	fting	g orde	er react	tions? l	Explaiı	n the b	ehavio	r with	an exa	mple	. (5)	
3A	A reactor is mol/(lt.s).	used	to ca	arry ou	t the re	action	A→R,	, -r _A =	0.0075	бС _А ,		(5)	
	t (s)	0	48	96	144	192	242	288	336	384			
	C(t) (g/cc)	0	0	0.	0.1	5	10	8	4	0			
	c). Ideal PFI	nver R wit	sion h a n	assumi nean re	ng a). I sidenc	e time	ow (PF of 260	S.	Mixed	l flow	(CS1	K)	
3B	Derive the p	erfoi	man	ce equa	ation fo	or a Re	cycle r	eactor				(5)	
4 A	Pure A (Cac	b = 1	00) i	s fed to	o a mix	ted rea	ctor. R	and S	are fo	rmed.	and t	the (5)	

4A Pure A ($C_{AO} = 100$) is fed to a mixed reactor, R and S are formed, and the following outlet concentrations are recorded. Find a kinetic scheme to fit this data. Make necessary assumptions and clarify. (5)

Run	CA	C _R	Cs
1	75	15	10
2	25	45	30

- **4B** Discuss the graphical procedure employed to find the conversion when (5) unequal sized MFR's are connected in series.
- **5A** With a neat sketch relate time and conversion for a spherical particle when (5) the controlling resistance is chemical reaction.
- **5B** Explain Instantaneous (Ψ) and over all fractional yields (ϕ). How is it (5) different from Selectivity?