

DEPARTMENT OF CHEMICAL ENGINEERING V SEMESTER B.TECH. CHEMICAL ENGINEERING END SEMESTER EXAMINATION

SUBJECT: MASS TRANSFER II (CHE 3152)

Exam Date & Time: 22-Nov-2022 (02:00 PM - 05:00 PM)

Time: 3 Hours

MAX. MARKS: 50

Q. No	D.						Que	stion			12111			Les ye	M	CO	BL
1A.	percen percen a total concer follow	t ethy t hep cond tratic s:	/l ber tane ense on da	nzene and a er and ata for	is to resideed the	be f due c at its hepta	ractiona containing s saturate nne-ethy	nole per ated to a ng 99 m ted liquity l benze	a dis nole id co ene	perce onditi at 1 at	e conta ent ethy ion. Th tm pres	ining 9 yl benz e entha ssure a	97 n ene alpy	nole using	5	2	3
	x	0		0.08	0.	18	0.25	0.49	0.	65	0.79	0.91	T				
	у	0		0.28	3807	.43	0.51	0.73	0788	2000	0.90	0.96					
	H _L (kJ/ki x 10 ⁻³		24.	.3 2	4.1	23.2	2 22.8	3 22.0)5	21.75	5 21.	7 21.	.6	21.4			
	H _V (kJ/ki x 10 ⁻³		61.	.2 5	9.6	58.5	5 58.1	56.5		55.2	54.4	4 53.	.8	53.3			
B.	Calcul	ate th	e mi	nimur	n nu	mber	of stag	ges for t	he c	lata g	iven in	Quest	ion	1A.	3	2	3
	is to be residua mole o	cont d liqu f feed nole,	tinuo tid p d, the calc	ously for roducted liqui- ulated	lash t con d pro the c	vapo ntains oduct conce	35 mo	each of vaporial e wapor of the	ze 6 nze pro	60 mo ne. If duct a	the enterespective	f the fe thalpie pective	eed. s pe	The er 2,5 and	2	1	3
2A.	A bina below Feed ra Mole f Mole f Botton Reflux In the	ate = raction pro- ration pro- strippe con	350 on o on o duct o = 3 oing	kmol f more f botte rate =	/h; (e vo om p = 20 on it n the	Overlatile latile orodu 0 km	head process composite to the composite	hat the	ate n ov mo	= 150 erhea ole fra is 0.3	kmol d prod ection of	/h; luct =	0.9°	7 re	4	3	4

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per ho	tinuous our of a l	fractionati iquid mixt	ng column ure containi	is to be design	ned for separa ercent methan	ting 10,000 k	g 4	3	
percer	nt water	into an ov	erhead proc	luct containin	g 97 mole pe	roont mathen	-1		
and a l	bottom r	roduct has	vina 98 mol	e percent water	er. A mole ref	lus ratio of 2	71		
used (Calculate	(i) moles	of overhead	percent wan	ined per hour a	and (ii) awarb	IS		
of ides	al nlates	and location	on of the fee	ed plate if the	feed is at its b	and (11) numbe	r		
X	0.1	0.2 0	.3 0.4				-		
V	0.417		.669 0.72			0.8 0.9	-		
YVIbat i						0.915 0.959	-		1
thermo	s/are the odynami	e assumption	on(s) of Mc	Cabe Thiele	method? Disc apport these as	uss about the	2	3	
. For ex	traction	of dioxane	from water	henzene ie u	ised as an extr	nation	4	4	+
solven	t The ec	milibrium	distribution	of dioyana h	etween water	action		4	
ac aiva	en below	quinorium.	distribution	of dioxane of	etween water	and benzene i	S		
			100						
Weig		5.1	18.9	9 2	5.2				
dioxa		-			P				
water								9	
Weigh		5.2	22.:	5 3:	2				
dioxa									
benze									
At the	se conce	ntrations,	water and b	enzene are ins	soluble, 1000	kg of solution			
contain	ing 25%	dioxane i	s to be extra	acted with ber	zene to remov	ve 95% of the			
dioxan	e. The di	ioxane free	benzene is	used as the se	olvent. Calcul	ate the			
				ge operation.					
Writes	short n	ote on an	two solid	liquid contac	ting equipme	ent sublab	4	5	
does no	at recult	in the ale	gaing by E	-nquid contac	schematic di	ent which	4	3	
does no	orresun	III the clo	gging by n	nes with neat	schematic di	agram			
Part .					contentatio di	agrain.	-		-
Dilute	ethanol-	water solu	utions can b	e continuous	ly rectified to	give at best	2	1	1
Dilute of	ctures co	ontaining l	utions can b 89.4 mole 9	oe continuous % ethanol at a	ly rectified to	give at best ressure,	2	1	2
Dilute of the mix since th	ctures co	ontaining to composi	utions can b 89.4 mole % tion of min	be continuous 6 ethanol at a imum boiling	ly rectified to atmospheric p	give at best ressure, the binary	2	1	1
Dilute of the mix since the system.	ctures co his is the . Ethano	ontaining a composi- of can be f	utions can b 89.4 mole % tion of min urther purif	be continuous 6 ethanol at a 6 imum boiling 6 ither by	ly rectified to atmospheric p azeotrope in using n-penta	give at best ressure, the binary ane as	2	1	1
Dilute of the mix since the system.	ctures con this is the Ethano er or eth	ontaining of composi- of can be fragilier of can be fragilier	utions can b 89.4 mole % tion of min urther purif col as solve	be continuous 6 ethanol at a imum boiling ied either by ent. Write sho	ly rectified to atmospheric p azeotrope in using n-penta ort notes on th	give at best pressure, the binary ane as the methods	2	1	
Dilute of the mix since the system.	ctures con this is the Ethano er or eth	ontaining of composi- of can be fragilier of can be fragilier	utions can b 89.4 mole % tion of min urther purif col as solve	be continuous 6 ethanol at a imum boiling ied either by ent. Write sho	ly rectified to atmospheric p azeotrope in using n-penta ort notes on th	give at best pressure, the binary ane as the methods	2	1	
Dilute of the mix since the system entrained which to	ctures con his is the Ethano er or eth uses the	ontaining a composi- ol can be f nylene glye above-me	utions can be a self- 89.4 mole 9 tion of minurther purifical as solve and to the artifical as solve antioned control as solve and as solve antioned control as solve and as solve and as solve	be continuous 6 ethanol at a imum boiling ied either by ent. Write sho mpounds in t	ly rectified to atmospheric p azeotrope in using n-penta	give at best pressure, the binary ane as the methods	2	1	1
Dilute of the mix since the system entrained which used corrections	ctures con his is the Ethano er or eth uses the mment con	ontaining to e composi- ol can be fraylene gly- above-me on the mos	utions can be a selected with the selected with the selected as solve and the selected with the select	be continuous of ethanol at a simum boiling fied either by ent. Write show mpounds in the method.	ly rectified to atmospheric p azeotrope in using n-penta ort notes on the he purification	p give at best pressure, the binary ane as the methods of ethanol			
Dilute the mix since the system entraine which u and corr	ctures con is is the continuous that is the continuous the continuous the continuous that is the continuous that i	ontaining to e composi- ol can be fraylene gly- above-me on the mos- eds conta	utions can be a self-self-self-self-self-self-self-self-	be continuous of ethanol at a simum boiling fied either by ent. Write show the mpounds in the method, ass % oil is the entire of	ly rectified to atmospheric p azeotrope in using n-penta ort notes on the he purification	o give at best pressure, the binary ane as the methods on of ethanol	5	5	
Dilute of the mix since the system. entrained which used to the correction of the co	tures con is is the control of the c	ontaining to e composite of can be frequency above-me on the most eds contained the oil	utions can be a selected as solve at desirable ining 28 m content to	be continuous of ethanol at a simum boiling fied either by ent. Write show the mpounds in the method, ass % oil is the old of the continuous of the continuo	ly rectified to atmospheric p azeotrope in using n-penta ort notes on the he purification to be extracted underflow. 1	o give at best pressure, the binary ane as the methods of of ethanol			
Dilute the mix since the system entrained which used to correct the correct th	tures con is is the . Ethano er or eth uses the mment or eth oil see to reduct is used	ontaining to composite composite can be for above-me on the most eds contained the oil of the contained the oil of the contained the oil of the contained the composite contained the contained the contained the composite contained the co	utions can be a selected as solve at desirable ining 28 m content to feed. Determine the selected as the selected as solve at the selected as solve at the selected as solve at the selected as solve as solve at the selected as solve as so	be continuous of ethanol at a simum boiling fied either by ent. Write show the mpounds in the method, ass % oil is the old of the continuous of the continuo	ly rectified to atmospheric p azeotrope in using n-penta ort notes on the he purification	o give at best pressure, the binary ane as the methods of of ethanol			
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Dilute the mix since the system entrained which using contractions of the contraction of	tures con is is the Ethano er or eth uses the mment of ethanological er to reduct is used counter-overflow	ontaining to composite composite of can be for the most eds contained the contained th	utions can be a selected as solve contioned country to the content to feed. Determine colution	be continuous to ethanol at a simum boiling fied either by ent. Write show the mpounds in the method. ass % oil is the ermine the new termine the new termine the method.	ly rectified to atmospheric p g azeotrope in using n-penta ort notes on the he purification to be extracted underflow. It to of stages re-	give at best pressure, the binary ane as the methods of ethanol ed with kg of equired			
Dilute of the mix since the system entrained which using contractions of the contraction	tures con is is the Ethano er or eth uses the mment of ethanological er to reduct is used counter-overflow	ontaining to composite com	utions can be 89.4 mole 9 tion of minurther purifical as solve entioned co at desirable ining 28 m content to feed. Determing.	be continuous to ethanol at a simum boiling fied either by ent. Write shompounds in the method, ass % oil is to 0.8% in the ermine the new to the ermine the new to the ermine the method.	ly rectified to atmospheric p azeotrope in using n-penta ort notes on the he purification to be extracted underflow. It of stages re	o give at best pressure, the binary ane as the methods on of ethanol and with the kg of equired			
Dilute the mix since the system entrained which the and correspond to the corresponding to th	Ethano er or eth uses the mment of ed oil se to redu t is used counter- verflow	ontaining to composite composite of can be for the most eds contained the contained th	utions can be a solved to the	be continuous to ethanol at a simum boiling fied either by ent. Write shown the method, ass % oil is to 0.8% in the ermine the new Ya (kg)	ly rectified to atmospheric programme programm	give at best pressure, the binary and as the methods of ethanol and with the kg of equired the slurry were considered to the constant of the kg of equired the kg of			
Dilute of the mix since the system. entrained which used to control of the contro	Ethano Et	ontaining to composite composite composite of can be frequency above-me on the most eds contained the contained th	utions can be a serious can be a serious can be a solved as solved and a solved aching 28 m content to a feed. Determine the aching. Wc (kg) 0	be continuous of ethanol at a simum boiling fied either by ent. Write show the mpounds in the method. ass % oil is the ermine the new Ya (kg) 67.2	ly rectified to atmospheric programme grant azeotrope in using n-pentary notes on the purification to be extracted underflow. It is of stages reflow (100 kg) W'B (kg) 32.8	give at best pressure, the binary and as the methods of ethanol ed with the kg of equired the solution of the kg of equired the			
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Dilute the mix since the system entrained which the and corresponding to the system of	ctures comis is the Ethano er or ethans the Ethano er or ethan er	ontaining to composite com	utions can be a solve tion of minurther purifical as solve entioned coast desirable ining 28 m content to feed. Determine where the content to feed the c	be continuous of ethanol at a simum boiling fied either by ent. Write show the mpounds in the method, ass % oil is to 0.8% in the ermine the new W'A (kg) 67.2 67.1 66.93 66.58 66.26 65.75 65.33 64.39	ly rectified to atmospheric programme programm	give at best pressure, the binary and as the methods of ethanol and with the kg of equired			

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4B	What is the signification column? Also desperating line.	2	2	2			
4C	Derive an express trays if the relative the column (provi	3	1	2			
5A	Write a shot note of a neat block diagra	2	4	1			
5B	Discuss any two ty exact application. in food industries.	Also comment on t		stries with their or such membranes	4	5	2
5C	A feed of 1200 kg	4	4	4			
	be extracted with p 3%. Determine the	ure benzene to redu minimum solvent ra	ce the solute conten	t in the raffinate to	7	7	
	be extracted with p 3%. Determine the Water	ure benzene to redu minimum solvent ra r layer	ce the solute content ate Benzer	t in the raffinate to	4	7	
	be extracted with p 3%. Determine the	ure benzene to redu minimum solvent ra	ce the solute conten	t in the raffinate to	7	7	7
	be extracted with p 3%. Determine the Water Pyridine (mass	minimum solvent ra r layer Benzene (mass	Benzer Pyridine (mass	t in the raffinate to ne layer Benzene (mass	67 1 5	7	
	be extracted with p 3%. Determine the Water Pyridine (mass %)	ure benzene to redu minimum solvent ra r layer Benzene (mass %)	Benzer Pyridine (mass %)	t in the raffinate to ne layer Benzene (mass %)	7	7	
	be extracted with p 3%. Determine the Water Pyridine (mass %) 1.17	ure benzene to redu minimum solvent ra r layer Benzene (mass %)	Benzer Pyridine (mass %) 3.28	t in the raffinate to ne layer Benzene (mass %) 94.54	4	7	
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	be extracted with p 3%. Determine the Water Pyridine (mass %) 1.17 3.55 7.39 13.46 22.78 32.15	Benzene (mass %) 0 0 0 0.15 0.25 0.44	Benzer Pyridine (mass %) 3.28 9.75 18.35 26.99 31.42 34.32	t in the raffinate to le layer Benzene (mass %) 94.54 87.46 79.49 71.31 66.46 64.48	4	7	
	be extracted with p 3%. Determine the Water Pyridine (mass %) 1.17 3.55 7.39 13.46 22.78 32.15 42.47	ure benzene to redu minimum solvent ra r layer Benzene (mass %) 0 0 0.15 0.25 0.44 2.38	Benzer Pyridine (mass %) 3.28 9.75 18.35 26.99 31.42 34.32 36.85	t in the raffinate to the layer Benzene (mass %) 94.54 87.46 79.49 71.31 66.46 64.48 59.35	4	7	

