Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**
PCCH4306

6th Semester Back Examination 2018-19
MASS TRANSFER-II
BRANCH : CHEM
Time : 3 Hours
Max Marks : 70
Q.CODE : F265

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions :** **(2 x 10)**

a) What is the size range of meso- pores?
b) Preparation of solids is important in leaching operations, Discuss.
c) Mention the factors influencing the fraction of liquid retained in the underflow in leaching operations.
d) Give an example of application of solvent extraction for waste water treatment.
e) Write and explain Freundlich equation.
f) Draw a typical gas and solid temperature profiles for drying of a non-hygroscopic solid in a cocurrent rotary dryer.
g) Name the extractor used for leaching of vegetable seeds.
h) What is the range of solid hold-up in rotary dryer?
i) Name two equipments used for leaching of fine solids.
j) What is hold up in a dryer?

Q2 **a)** Explain the construction and operation of Drum drier with neat diagram. **(5)**
b) Describe the important factors affecting the selection of a Liquid – Liquid Extractor **(5)**

Q3 **a)** Graphically explain different types of moisture in a wet solid. **(5)**
b) Explain the construction and operation of Rotating fixed-bed adsorber with neat diagram. **(5)**

Q4 **a)** Discuss the important factors affecting the rate of leaching of a solute from solid substance. **(5)**
b) Derive the equation for total drying time. **(5)**

Q5 **a)** What are the different criteria for the selection of a good adsorbent? **(5)**
b) 400kg/hr of mustard cake is to be extracted in a counter-current cascade with ethet to recover oil. The ether which has been partially purified contains 5% oil. The fresh cake contains 15% oil and is to be extracted to a composition of 2% oil (on solvent free basis). If 200kg of solvent is to be used, what % of oil entering with the cake is recovered in the extract? **(5)**

Q6 3000kg of pyridine-water solution containing 45% pyridine is extracted with chlorobenzene two times and each time with 2600kg of solvent. Determine the concentration of pyridine in the final raffinate. Equilibrium tie-line data for the system water-pyridine-chlorobenzene at 25°C are given below: **(10)**

Pyridine	Chlorobenzene	Water	Pyridine	Chlorobenzene	Water
0	99.95	0.05	0	0.08	99.92
11.05	88.28	0.67	5.02	0.16	94.82
18.95	79.90	1.15	11.05	0.24	88.71
24.10	74.28	1.62	18.90	0.38	80.72
18.60	69.15	2.25	25.50	0.58	73.92
31.55	65.58	2.87	36.10	1.85	62.05
35.05	61.00	3.95	44.95	4.18	50.87
40.60	53.00	6.40	53.20	8.90	37.90
49.00	37.8	13.2	49.00	37.80	13.20

Q7 One type of paper board of 0.13X0.16X0.07m^3 in size is to be dried from initial moisture content of 60% to 6% on wet basis. The rate of drying at constant rate period is 9.2kg/m^2.hr. The crictical moisture content was 25% and the equilibrium moisture content was 2%. The paper board is to be dried from two larger sides only and has a bone-dry density of 180kg/m^3 Determine the time required for drying assuming the falling rate to be linear. **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Effect of temperature on ternary equillibria

b) Industrial adsorbents

c) Ion exchange