

SEAT No. _____

SARDAR PATEL UNIVERSITY No. of Printed Pages : 02

[22]

M. Sc. (Industrial Chemistry), First (1st) Semester Examination

November - 2017

PS01CICH 23--Industrial Management & Psychology

Thursday, 2nd November, 2017

Time: 10:00 a.m. to 01:00 p.m.

Total Marks: 70

- Note: i) Attempt all the questions.
ii) Figures to right indicate full marks.
iii) Draw neat diagrams wherever it requires.

- | | | Marks |
|-----|--|-------------|
| Q-1 | Answer the following Multiple Choice Questions. | (08) |
| 1. | _____ is a way of respond of frustration.
a) Adaptive
b) Stress
c) Hard work
d) Argument | |
| 2. | According to Stagner moral will be at a maximum when situation _____ exist.
a) A
b) B
c) C
d) D | |
| 3. | _____ is a process to identify and determine in detail the particular job duties and reuirements.
a) Job description
b) Job specification
c) Job analysis
d) Argument | |
| 4. | HRM may be defined as a set of policies designed to maximize both _____ and organizational goals.
a) personal
b) personnel
c) manager's
d) country | |
| 5. | _____ deals with the design and management of products, processes, services and apply chains.
a) Operations Management
b) Financial Management
c) Marketing Management
d) Cost assessment | |
| 6. | Which is the first stage of new product development process?
a) Idea generation
b) Market testing
c) Commercialization
d) Maturity | |
| 7. | Executive finance functions include:
a) all those financial decisions of importance which require specialized administrative skill.
b) those functions of clerical or routine nature which are necessary for the execution of decisions taken by the executives.
c) arrangement of funds
d) None of the above. | |
| 8. | _____ is the one of the marketing-mix elements.
a) Introduction
b) Decline
c) Distribution
d) Growth | |

Q-2 Answer the following short questions. Each question carries equal mark. **(Any Seven) (14)**

1. What is an Individual difference?
2. What is the importance of frustration in Industries?
3. What are the differences between HR policies and procedures?
4. Define: recruitment.
5. What are the components of marketing?
6. What is batch production?
7. What is production management?
8. What is Cash Flow Statement?
9. Define: Financial Accounting.

Q-3 (a) What are the objectives of employee development? **(06)**

Q-3 (b) 1) What is placement? Give the benefit of placement. **(06)**
2) Give a note on basic need for training.

OR

Q-3 (b) Briefly describe all four elements of HR. **(06)**

Q-4 (a) What is the scope of financial management? **(06)**

Q-4 (b) Explain the concept of market opportunities analysis & describe how market opportunities are analyzed. **(06)**

OR

Q-4 (b) 1) What is Fund Flow Statement? **(03)**

2) What is Balance Sheet? **(03)**

Q-5 (a) Explain the scope of operations management. **(06)**

Q-5 (b) What is production management? Explain with example. **(06)**

OR

Q-5 (b) What is Production Planning and Control? Explain its objectives. **(06)**

Q-6 (a) Explain in detail key forces affecting organizational behavior. **(06)**

Q-6 (b) Explain with diagram Stress and job performance. **(06)**

OR

Q-6 (b) What is the role of psychologist in Industry? **(06)**

All the Best!

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SEAT No. _____

[16]

No. of Printed Pages : 3+1

SARDAR PATEL UNIVERSITY

EXTERNAL EXAMINATION, NOVEMBER 2017

M.Sc. INDUSTRIAL CHEMISTRY-SEMESTER 1

MASS TRANSFER OPERATIONS -PS01CICH24

6th November, 2017

Max.Marks:70

Time:10.00 a.m -1.00 p.m

Answer all the questions.

Figures to the right side indicate marks

Q1. Write the number of the correct answer. (Each question carries one mark) (08)

- a. Selectivity of solvent used in liquid extraction should be
i. 1 ii. >1 iii. <1 iv. 0
- b. The residual liquid of liquid extraction is called as
i. Feed ii. Raffinate iii. Extract iv. Solvent
- c. Ponchon-Savarit method analyzes distillation based on
i. Enthalpy balance iii. Mass balance
ii. Both enthalpy and mass balance iv. None of the above
- d. For the same feed and solvent rates, which of the following will give a better separation?
i. Single stage cross current extraction iii. Multistage counter current extraction
ii. Multistage cross current extraction iv. All of the above give same separation
- e. Channeling can be minimized by having the diameter of the tower at least _____ times the packing diameter.
i. 8 ii. 18 iii. 1/8 iv. 80
- f. Which of the following process can accelerate leaching?
i. Crushing & grinding iii. Heating
ii. Drying iv. None of these
- g. The Moisture contained by substance which exerts equilibrium vapour pressure less than that of pure liquid at the same temperature is known as _____.
i. Bound moisture ii. Unbound moisture
ii. Moisture content iv. Wet basis
- h. Filtration is useful when
i. Only one solid is soluble iii. Both solids are soluble
iii. Both solids are insoluble iv. When both liquids are miscible

Q2. Answer any seven (7 * 2 =14 marks)

- a. What is the effect of reflux ratio on the no. of stages in a distillation column?
- b. Define selectivity and distribution co-efficient as applied to liquid extraction?
- c. Why should the boiling point of solvent be considered in the selection of solvent for liquid extraction?
- d. Define selectivity and distribution co-efficient as applied to liquid extraction?
- e. Write the principle of vacuum distillation
- f. What is desorption? Give its one example
- g. What is leaching?
- h. Define equilibrium moisture and free moisture.
- i. What is the role of coagulants in filtration?

Q3.

- a. 1000 kg/hr of aqueous ammonia solution with 26 % ammonia is separated using steam distillation to get a distillate with 99.5 % ammonia ($h_D = 52.3$ kcal/kg) and a residue with 2 % ammonia. If saturated steam ($H_s = 1400$ kcal/kg) is to be used and if a reflux ratio of 1 is used, calculate the amount of steam to be supplied. The enthalpy of vapour leaving the column may be taken as 584 kcal/kg. (06)

Mole fraction	0	0.05	0.1	0.3	0.5	0.7	0.8	1
Enthalpy (liquid) kcal/kg	350	302	261.6	124	31	10.5	18.7	53.4
Enthalpy (vapour) kcal/kg	1230	1172.7	1148.7	1049	945.6	832.5	800.8	600

- b. Determine the optimum reflux ratio for the given system of methanol-water which is to be separated using distillation. (06)

F=4800 kg/hr, $x_F = 40\%$, $h_F = 68$ Kcal/kg, $x_D = 97\%$, $x_W = 3\%$, $h_D = 52$ kcal/kg								
Mole fraction	0	0.2	0.4	0.6	0.8	0.9	1	
Enthalpy (liquid) kcal/kg	345	185	70	11	22	40	65	
Enthalpy (vapour) kcal/kg	1200	1100	1000	890	770	700	554	

x	0	0.2	0.4	0.6	0.8	0.9	1
y	0	0.7	0.9	0.95	0.98	0.99	1

OR

- b. Derive the operating equation for enriching and stripping sections of a fractionator using Ponchon-Savarit method (06)

Q4.

- a. Derive the operating line equation using material balance diagram for the packed column. (06)
- b. Discuss the L/V ratio in detail. (06)

OR

- b. Discuss the effect of pressure drop and flow rate on gas absorption. (06)

Q5.

- a. The pressure drop (ΔP) due to obstruction in a pipe depends on dia of pipe D , velocity of fluid V , density ρ and viscosity of fluid μ . Show using Rayleigh's method that (06)
- $$\Delta P = \rho V^2 \varphi(N_{Re})$$
- b. 1000 kg/hr of acetic acid-water solution with 40 % acetic acid is to be cross currently extracted with 300 kg ethyl acetate solvent in each stage so as to reduce the acetic acid concentration to 2 % in the final Raffinate. Determine the number of theoretical stages required. (06)

Extract			Raffinate		
A	B	C	A	B	C
0.5	85.5	14	87.5	2.5	10
3	73	24	77	3	20
7.5	58.5	34	65	5	30
11	50	42	58	7	35
15	42	43	51	9	40
25	29	46	45	12	43

OR

- b. With the help of a neat figure, explain the principle and working of mixer-settler cascade used in liquid extraction (06)

Q6

- a. Derive the equation for volume of filtrate (V) and thickness of cake (l) for constant rate and constant pressure filtration. (06)
- b. A batch of the solid is dried from 25% to 5% moisture. The initial weight of the wet solid is 200kg and the drying surface is 1m²/35kg dry weight. Determine the constant rate period of time and falling rate of time in hour require for drying wet solid. (06)

X	N
0.24	0.400 x 10 ⁻⁴
0.22	0.400 x 10 ⁻⁴
0.21	0.400 x 10 ⁻⁴
0.18	0.266 x 10 ⁻⁴
0.15	0.239 x 10 ⁻⁴
0.13	0.208 x 10 ⁻⁴

X	N
0.12	0.180 x 10 ⁻⁴
0.11	0.150 x 10 ⁻⁴
0.10	0.097 x 10 ⁻⁴
0.08	0.070 x 10 ⁻⁴
0.06	0.043 x 10 ⁻⁴
0.05	0.025 x 10 ⁻⁴

OR

- b. Discuss the effect of pressure on filtration. (06)

*****Best of luck*****

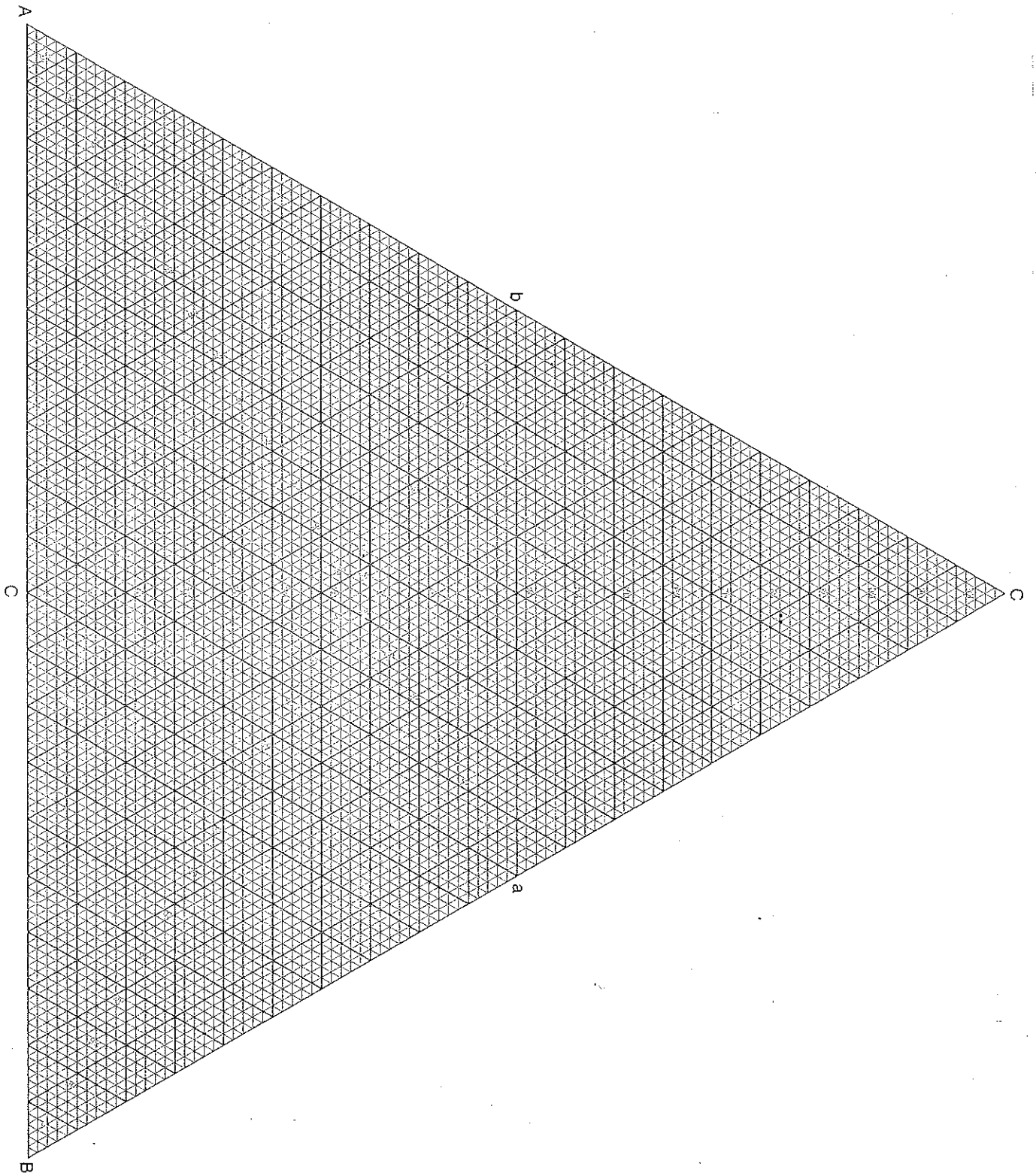
1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial statements and for providing a clear audit trail. The second part of the document outlines the various methods used to collect and analyze data, including interviews, surveys, and focus groups. The third part of the document describes the results of the study, which show that there is a significant correlation between the use of accurate records and the reliability of the financial statements.

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Year	Revenue	Expenses	Profit
2010	100	80	20
2011	120	90	30
2012	150	100	50
2013	180	120	60
2014	200	140	60

DATE : _____

P.NO. : _____



[58]

SEAT No. _____

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY**M. Sc. Semester - I Examination****Wednesday, 8th November 2017****INDUSTRIAL CHEMISTRY****Subject: Industrial organic chemistry**Date: 08/11/2017, Wednesday
Time: 10:00 a.m. to 01:00 p.m.

Course No. : PS01CICH25

Marks: 70

[08]

Q. 1 Multiple choice questions (Attempt all)

- I _____ reagent is used in the synthesis of phenyl ethyl ether.
 (a) Aluminum-t-butoxide (b) BF_3
 (c) Ozone (d) DCC
- II _____ is used in the degradation of alcohol.
 (a) Aluminum-t-butoxide (b) BF_3
 (c) Ozone (d) DCC
- III The group which contains negatively charged carbon atom is called as _____.
 (a) Carbonium ion (b) Carbon free radical
 (c) Carbanion (d) Heavy carbon
- IV Benzynes _____
 (a) m-dichlorobenzene (b) 1,2 dihydrobenzene
 (c) m-nitrophenol (d) Benzene
- V _____ is the reductive amination which involves treatment of aldehyde and ketones with ammonium formate to give formyl derivatives of primary amines.
 (a) Aldol condensation (b) Perkin reaction
 (c) Lucart's reaction (d) Dakin reaction
- VI The reaction of an aromatic aldehyde with an aliphatic acid anhydride in presence of sodium or potassium salt of the acid corresponding to anhydride to give α, β -unsaturated acid is known as _____.
 (a) Aldol condensation (b) Perkin reaction
 (c) Lucart's reaction (d) Dakin reaction
- VII Melting point of DMSO is _____ $^{\circ}\text{C}$
 (a) 19 (b) 59
 (c) 89 (d) 119
- VIII Boiling point of THF is _____ $^{\circ}\text{C}$
 (a) 56 (b) 66
 (c) 76 (d) 86

Q. 2 Answer the following short question (Any seven)

[14]

- I Write advantages of polyphosphoric acid
- II Write in brief about diazo acetic ester.
- III Define unit operation and unit process.
- IV Enlist facts can be explain by proposed reaction mechanism.
- V Write in brief about free radicals.
- VI Write the principle of Wurtz reaction.
- VII Write the principle of Meerwein-Ponndorf reaction.
- VIII Enlist the uses of benzoic acid.
- IX Enlist uses of diethyl ether.

(1)

C P T O

- Q.3 (a) Write preparation and application of aluminum-t-butoxide. [06]
(b) Write preparation and uses of boron trifluoride. [06]
Or
(b) Write note on platinum. [06]
- Q.4 (a) Differentiate between free radical reaction and ionic reaction. [06]
(b) Write note on carbonium ions. [06]
Or
(b) Differentiate between nucleophile and electrophile. [06]
- Q.5 (a) Write principle, mechanism and application of Dakin reaction. [06]
(b) Write principle, mechanism and application of Cannizaro reaction. [06]
Or
(b) Write principle, mechanism and application of Aldol condensation. [06]
- Q.6 (a) With the help of flow diagram explain manufacture of benzoic acid from toluene. [06]
(b) With the help of flow diagram explain manufacture of DMF. [06]
Or
(b) With the help of flow diagram explain manufacture of DMSO. [06]

Best of Luck.....

2

(62)

SEAT No. _____

No. of Printed Pages: 250

SARDAR PATEL UNIVERSITY

SEMESTER EXAM, M.Sc. INDUSTRIAL CHEMISTRY

SEMESTER -1, PS01EICH21-TECHNOLOGY OF OLEOCHEMICALS AND SURFACTANTS

10-11-2017, Friday, TIME: 10:00 a.m to 1:00 p.m

Total Marks: 70

Note: Attempt all questions. Draw neat and labeled diagram where ever necessary. Figures on the right show marks.

Q.1. Answer the following MCQs.

(08)

1. Oleochemicals are the chemicals derived from _____

A. Oils and Fats B. Petroleum C. Natural Gas D. None of these

2. _____ are the major constituents of any oil or fat

A. Mineral acids B. Fatty acids C. Amino acids D. Dimer acids

3. _____ method uses sulphuric acid as a catalyst

A. Autoclave B. Twitchell C. Enzyme D. Both B & C

4. _____ fatty acids have higher melting points

A. Saturated B. Unsaturated C. Conjugated D. Non-Conjugated

5. Resolution of fatty esters into the component fatty acids and glycerol is termed as _____

A. Fat Splitting B. Fat Solubilizing C. Fat Mixing D. All of these

6. The diesel fuel used in automobile is _____

A. DF1 B. DF2 C. DF3 D. DF4

7. _____ is the important cold property of biolubricant.

A. Boiling point B. Flash point C. Fire point D. Pour point

8. _____ emulsion conducts electricity

A. O/W B. W/O C. micro D. all of these

(1)

(P.T.O.)

Q.2 Answer the following short questions(Any 7)

(14)

1. What is degree of split?
2. What soap stock?
3. What is foam?
4. Explain the term- AOS.
5. What are SI and CI engines?
6. What is viscosity index for lubricants?
7. Discuss the classification of oils on the basis of their unsaturation.
8. What is pour point?
9. What is the role of adjuvant in pesticides?

Q.3 (a) Discuss important physical properties of oil.

(06)

Q.3 (b) Present an overview of different methods of fatty acid production by fat splitting

(06)

OR

Q.3 (b) Discuss in details the separation of fatty acids by distillation

(06)

Q.4(a) What are basic oleochemicals and oleochemical derivatives? Discuss the advantages of oleochemicals over petrochemicals

(06)

Q.4(b) Discuss various methods of fatty acid production

(06)

OR

Q.4(b) Write a note on fatty acid methyl esters

(06)

Q.5(a) Enlist the important physico-chemical properties of Bio lubricants and give brief discussion of Cold properties and Fire resistance properties of biolubricants.

(06)

Q.5(b) Explain in brief regarding suitability of oilbased materials as diesel fuel

(06)

OR

Q.5(b) Write a short note on functions of oleochemicals as agrochemical adjuvants.

(06)

Q.6(a) What are surfactants? Discuss the uniqueness of their structure and enlist various major properties exhibited by them.

(06)

Q.6(b) Describe in brief the production and applications of LABS.

(06)

OR

Q.6(b) Discuss in brief emulsions and dispersion exhibited by surfactants

(06)

-----x Good Luck x-----

2 of 2

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