

SUBJECT CODE NO:- P-9
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem.) Examination May/June 2017
Industrial Pollution & Control
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Answer in full question no 1 and question no 6 from each section.
 - ii) Answer any two from remaining questions of each section A&B.
 - iii) Assume data if necessary.

Section A

- Q.1 Define: 10
- a) inversion b) wind Rose c) fog d) ALR e) Plume
- Q.2 Explain in brief the environment legislation for air and water pollution. 15
- Q.3 a) Explain the formation of photo chemical smog? 07
b) With the help of neat sketches explain various types of plume. 08
- Q.4 What are the advantages and disadvantages of the following equipment? 15
- a) ESP
b) fabric filter
c) cyclone separator
- Q.5 Write notes on: 15
- a) Collection efficiency calculation of gravity settling chambers
b) Secondary metrological parameters.
c) Air prevention & control act.

Section B

- Q.6 Define the following: 10
- a) BOD b) Anaerobic process c) Oxygen sag curve d)Suspended growth process d) Do
- Q.7 Why is it necessary to remove nitrogen from the effluent? Describe ammonia stripping in details. 15
- Q.8 Using the following data, find out dissolved oxygen. At end of 1 and 2 day. 15
- | | River | waste water |
|--------------------------|----------------------|---------------------|
| flow (m ³ /s) | 2.5m ³ /s | 2 m ³ /s |
| DO (mg/L) | 9.1 | 0 |
| 5 days BOD (mg/c) | 2 | 200 |
- Q.9 Give the laboratory procedure to determine the following: 15
- a) BOD
b) COD
c) TDS
- Q.10 Write notes on: 15
- a) Classification of water pollutants
b) Activated sludge process
c) Removal of phenol

SUBJECT CODE NO:- P-34
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CHEM) Examination May/June 2017
Chemical Reaction Engineering-I
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory.
 - ii) Answer any two questions from remaining of each section.
 - iii) Assume suitable data if required.

Section A

- Q.1 Answer following terms. 10
- a) Space time
 - b) Classification of reactions.
 - c) Rate constant of reaction.
 - d) Non-elementary reactions.
 - e) Free radicals reaction mechanism.

- Q.2
- a) Explain in detail with relevant equation. The temperature dependency of rate constant using Arrhenius law. Also give comparison of collision theory with Arrhenius law. 08
 - b) A first order reaction is to be treated in series of two mix reactors. Show that the volume of two reactors is minimum when reactors are of equal size. 07

- Q.3
- a) Derive an equation for second order reversible reaction in terms of equilibrium conversion. 08
 - b) 100 lit per hr of radioactive fluid having half-life period of 20 hr is to be treated by passing it through two ideal mixed reactors in series of volume 40000 lit each. In passing through system, how much has the activity decayed? 07

- Q.4
- a) Explain the differential method of analysis for rate equation. State major differences between integral method and differential method of analysis. 08
 - b) Find a rate equation for a reaction in batch reactor where initial concentration is $C_{A0}=1$ mol / lit. If conversion reaches 80% for which time is 8 minutes and reaches 90% in 18 min . 07

- Q.5 Write note on. 15
- a) Molecularity & order of reaction.
 - b) Search for reaction rate mechanism.
 - c) Reaction of shifting order.

Section - B

- Q.6 Answer following terms. 10
- a) Non adiabatic operations.
 - b) Size comparison of single reactors.
 - c) Equilibrium constant.
 - d) Recycle reactor.

2017

- e) Proper product distribution of reaction.
- Q.7 a) Derive the performance equations of the steady state plug flow reactor. Also show neat graphical representation. 08
 b) What is effect of temperature on equilibrium conversion? 07
- Q.8 a) A gaseous reactant A Decomposes as $A \rightarrow 3R$, $-r_A = (0.6 \text{ min}^{-1}) C_A$ find conversion of A in a 50% inert feed ($V_o = 180 \text{ lit/min}$ & $C_{Ao} = 300 \frac{\text{mmol}}{\text{lit}}$) to a 1 m^3 mixed flow reactor. 10
 b) Explain in details kinetics of autocatalytic reaction. 05
- Q.9 a) Explain in detail the reaction kinetics of first order reaction followed by zero order reaction. 08
 b) How will you construct the rate- conversion - temperature chart from kinetic data. 07
- Q.10 a) Write note on. 15
 1) Autocatalytic reactions
 2) Optimum temperature progression
 3) Product distribution in series reaction.

SUBJECT CODE NO:- P-67
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Material Science & Technology
(Revised)

[Time:ThreeHours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and 6 are compulsory.
 - ii) Solve any two questions from the remaining in each section
 - iii) assume suitable data wherever required
 - iv) Draw neat sketches whenever required.

Section A

- Q.1 Define following terms (any five) 10
- a. Crystal structure
 - b. Structure of atom
 - c. space lattice
 - d. Covalent bonding
 - e. Plastic deformation
 - f. Bond energy
- Q.2 1. Describe various types of material used in chemical industry for process equipment. 08
2. What is Bohr's atomic theory explain in detail. 07
- Q.3 a. Explain procedure & Characteristics of miller indices of crystal planes with example. 08
b. Explain quantum states of electron 07
- Q.4 a. Describe wave nature of electron. 08
b. What is Bragg law. Explain on detail. 07
- Q.5 With neat sketch write down powder crystal method. 15

Section-B

- Q.6 Define following terms (Any five) 10
- a. Curie point
 - b. Magnetic potential
 - c. Ductile fracture
 - d. Ferri magnetism
 - e. galvanic corrosion
 - f. Brass
- Q.7 a. what are the environmental effect of corrosion. 08
b. Write down different types of non-metallic materials. 07
- Q.8 a. State different factor affecting the fatigue strength. 08
b. Explain the mechanism of creep. 07
- Q.9 a. Write down application of magnetism 07
b. What is critical transition temp. Explain it briefly. 08
- Q.10 Explain super conductivity types of super conductivity and meissner effect with neat sketch. 15

SUBJECT CODE NO:- P-99
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Chemical Engineering Thermodynamics
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

- i)Q.No. 1 & 6 are compulsory.
- ii)Answer any two questions from remaining of each section.
- iii)Assume suitable data if required.

Section A

- Q.1 Explain following terms. 10
- a) Concept of fugacity
 - b) Activity of solution
 - c) Standard state for gas
 - d) Gibb's free energy
 - e) Henry's law of dilution.
- Q.2 a) What is effect of temperature and pressure on fugacity? Explain with relevant equation. 08
b) The density of gaseous NH_3 at 473 K and 50 bar is 24.3 Kg/m^3 . Estimate its fugacity. 07
- Q.3 a) Derive an expression for Lewis-Randall rule for fugacity in solution. Also state its validity condition. 08
b) Show that in a binary solution, if the molar volume of one of the components increases with Concentration, the molar volume of other must decrease. 07
- Q.4 a) Define Excess thermodynamic properties & derive an expression for calculation of excess Gibb's free energy. 08
b) What are different types of Thermodynamic diagrams? List their respective fields of application. 07
- Q.5 Write note on: 15
- a) Maxwell equations
 - b) Calculation of lost work
 - c) Property change of mixing.

Section B

- Q.6 Answer following terms. 10
- a) T-x-y diagram.
 - b) Raoult's law
 - c) Azeotropes at minimum boiling points.
 - d) Extent of chemical reaction.
 - e) Equilibrium constant.
- Q.7 a) Explain with relevant equation the phase equilibrium in single component system. 08
b) Air is cooled to 80K at 101.3KPa. Calculate the composition of liquid and vapour phases as this condition assuming that mixture behaves ideally. The vapour pressure of N_2 and O_2 at 80 K are 135 Kpa and 30.05 Kpa respectively. 07
- Q.8 a) Explain the Le-Chatelier's principle & derive an equation for effect of temp. on equilibrium constant. 08

b) Calculate equilibrium constant at 298 K for a reaction



Given that the standard Gibb's free energy of formation at 298 K are 97540 J/mol for N_2O_4 and 51310J/mol for NO_2

- Q.9 a) The azeotrope of n-propanol –water system has a composition 56.83% (mol) water with a boiling point of 360.9 K at a pressure of 101.3 Kpa. At this pressure vapour pressure of water-propanol are 64.25 Kpa & 69.71 Kpa respectively. Calculate activity coefficient for solution containing 20% water using Van-Laar equation. 10
- b) Distinguish between bubble point & dew-point temperatures. 05
- Q.10 Write note on:- 15
- a) NRTL equation
- b) VLE at low pressure
- c) Criteria for chemical reaction equilibria.

SUBJECT CODE NO:- P-134
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CHEM) Examination May/June 2017
Mass Transfer Operations-I
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Question number 1 and 6 are compulsory
 - ii) Answer any two questions from remaining of each section.

Section A

- Q.1 Answer the following 10
- a) According to penetration theory mass transfer coefficient is directly proportional to
 - i) D_{AB} ii) D_{AB}^2 iii) $D_{AB}^{1.5}$ iv) $D_{AB}^{0.5}$
 - b) Synthetic detergent powder is produced by drying detergent slurry in a
 - i) spray drier ii) cylinder drier iii) freeze drier iv) open pan evaporator.
 - c) What is Knudsen diffusivity?
 - d) State industrial application of bubble column
 - e) Diffusion is a process of
 - i. movement of particle from higher concentration to lower concentration
 - ii. movement of particle through semi permeable membrane
 - iii. refraction of particle
 - iv. accumulation of particle on solid surface
- Q.2 a) State and explain Fick's law of diffusion 05
b) Derive expression for diffusion of A through non-diffusing B. 10
- Q.3 a) With the help of diagram describe various packing. 10
b) Describe construction and working of venturi meter. State its application. 05
- Q.4 a) Classify various driers 05
b) A certain material was dried under constant drying condition and it was found that 2 hours are required to reduce the free moisture concentration from 20% to 10% how long will it take to reduce free moisture to 4% Assume no constant rate period is encouraged. 10
- Q.5 Write short notes on: 15
- a) Drying curve
 - b) Two film theory
 - c) Wetted wall column

Section B

- Q.6 Answer the following 10
- a) Adsorption of acetone vapor on activated carbon is
 - i) highly endothermic process ii) an exothermic iii) a slightly exothermic iv) none of these
 - b) Separation of a mixture of two gases by absorption in liquid solvent depends on difference in
 - i) density ii) viscosity iii) solubility iv) relative volatility
 - c) Define percentage humidity

- d) What is adsorbate?
 e) Desorption of adsorbed solute by solvent is called
 i) reverse osmosis ii) dialysis
 iii) sublimation iv) elution
- Q.7 a) What decides successful working of absorption column 10
 b) A gas absorber has to be designed to handle 900 cubic m per hr of coal gas containing 2% by volume 05
 benzene coal gas enters at a temperature 300k containing 0.005 mole traction. Of benzene & has
 average molecular weight of 260. What is circulation rate of solvent per second if the column is to be
 operated at 1.5 times minimum L_s ?
 Equilibrium data is. $\frac{y}{1+y} = 0.125 \frac{x}{1+x}$
 y is mole ratio of benzene to dry gas
 x is mole ratio of benzene to solvent
- Q.8 a) Explain the mechanism of adsorption 05
 b) Describe freundlich and langmuir isotherm 10
- Q.9 a) Explain the concept of wet bulb and dry bulb temperature. 05
 b) In a process in which it is used as solvent benzene is evaporated into dry nitrogen. At 297k & 101.3kN/m², the resulting mixture to recover 80% of benzene present by cooling to 283k & compressing to a suitable pressure. What should this pressure be? 10
- Q.10 Write short note on 15
 a) Absorption column
 b) Molecular sieve
 c) Construction of natural draft cooling tower

SUBJECT CODE NO:- P-216
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Chem.) Examination May/June 2017
Process Equipment Design & Drawing - I
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory. Solve any two from remaining in each section.
 - ii) Assume suitable data wherever required.
 - iii) draw neat sketches wherever required

Section A

- | | | |
|-----|--|----|
| Q.1 | a. Explain lining of vessel | 04 |
| | b. fabrication techniques | 03 |
| | c. flange rating | 03 |
| Q.2 | a. Explain cathodic protection system to prevent corrosion. | 08 |
| | b. Write down stress characteristics of material | 07 |
| Q.3 | a. Estimation of equipment weight for pressure vessel. | 08 |
| | b. Explain closures of vessel. | 07 |
| Q.4 | a. Describe Bolt load, bolt selection & Bolt circle diameter | 08 |
| | b. Explain Gasket seating stress & gasket factor | 07 |
| Q.5 | a. A cylindrical shell of a vessel has an inside diam. 2m and is subjected to an internal pressure 5 kg/cm ² . Calculate required thickness & corresponding deflection. Allowable tensile stress of material is 1020kg/cm ²
$\mu=0.3, E=2.09 \times 10^6 \text{ Kg/cm}^2$ | 10 |
| | b. What are various polymeric material used for process equipment | 05 |

Section B

- | | | |
|------|--|----|
| Q.6 | Explain following. | |
| | a. Anchor Bolt for skirt support | 04 |
| | b. stuffing box | 03 |
| | c. ovalizations of storage tank | 03 |
| Q.7 | a. Explain silent design features of spherical storage tank with neat sketch | 08 |
| | b. What are different losses that can occur in storage tank? | 07 |
| Q.8 | a. A horizontal circular oil storage tank of mild steel plates is to be fabricated. The capacity of storage tank is 22m ³ | 15 |
| | b. $\rho_{oil} = 930 \text{ kg/m}^3$, plates of 1.8m x3.6m are available | |
| | c. $\rho_{steel} = 8000 \text{ kg/m}^3$ Tank covers are flat plates. Suggest suitable design. Calculate stresses induced in tank plates. | |
| Q.9 | a. Give suitable design of tall vertical column | 10 |
| | b. How is thickness of horizontal plate & gusset plate of bracket support evaluated? | 05 |
| Q.10 | a. A tall vertical vessel 2.2 m in outside diam. & 34m in height has a shell thickness 14mm. Corrosion allowance is not necessary. Vessel is insulated with 80mm thick magnesia insulation. The vessel has no attachments. Wind force acting over the vessel is 128 kg/m ² , wt. of vessel =91000 kg. Calculate bending moment induced in vessel & estimate resulting bending stress. | 10 |
| | b. How is max. Compressive load acting on bracket is evaluated. | 05 |

SUBJECT CODE NO:- P-239
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Chemical Reaction Engineering-II
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 And Q.No.6 is compulsory. Solve any two from remaining in each section
 - ii) Draw neat sketches whenever required.
 - iii) Assume suitable data whenever required.

Section A

- Q.1 Solve any five. 10
- a. Define E curves.
 - b. RTD
 - c. Rate of reaction
 - d. Fluid particle reaction
 - e. Film convention parameter
 - f. Slow reaction.
- Q.2 07
- a. Describe relationship between E & F curves
 - b. The data given below represent continuous response to a pulse input into a closed vessel which is to be used as a chemical reactor calculate mean residence time of fluid in vessel which is to be used as a chemical reactor calculate mean residence time of fluid in vessel \bar{t} , & tabulate & construct E curve 08

T, min	0	5	10	15	20	25	30	35
L pulse g/l crucer	0	3	5	5	4	2	1	0

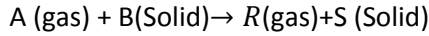
Output cone

- Q.3 A Describe unreacted core model for spherical particle of unchanging size. 07
- B Explain mathematics of progressive conversion model reactors for fluid particle non catalytic reaction. 08
- Q.4 A Derive rate education for instantaneous reaction. 08
- B Describe mass transfer with chemical reaction. 07

- Q.5 Write short note. 15
- a. Self mixing of single fluid
 - b. Progressive convention model
 - c. Slurry reaction kinetics.

Section B

- Q.6 Explain following terms. 04
- a. N₂ desorption method 03
 - b. Freundlich isotherm 03
 - c. Effectiveness factor. 03
- Q.7 Describe selection & proportion catalyst for industrial reactions. 08
- In a gas- phase environment, particle of B are converted to solid product as follows 07



Reaction proceeds according to shrinking core model with reaction control & with time for complete conversion of particles of 1 hr, A fluidized bed is to be designed to treat 1 ton /hr solids to 84% conversion using a stoichiometric feed rate of A, fed at C_{A_0} . find weight of solids in the reactor if gas is assumed to be in mixed flow.

- Q.8 A A second order reaction $A \rightarrow R$ is studied in a recycle reactor with large recycle reaction. Given that void volume of reactor = 1.2 Lit wt. of catalyst used = 4gm feed to reactor $C_{A_0} = 2.4 \text{ mol/lit}$, $V_a = 1.2 \text{ lit/hr}$, Exist stream condition $C_{A_{out}} = 0.6 \text{ mol/lit}$. find rate construct for 10
- B Describe various resistances in catalyst pellets. 05
- Q.9 Design & write down mechanism of Trickle bed reactors. 08
Describe construction & working of Adiabatic fixed bed reactors. 07
- Q.10 Write short note. 15
- a. Isothermal reactors
 - b. Heat effects during reaction
 - c. Water gas shift reaction.

SUBJECT CODE NO:- P-270
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Mass Transfer Operations-II
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

- i) Q.NO.1 & Q.NO.6 are compulsory.
- ii) solve any two question from remaining of each section A & B
- iii) Assume suitable data if necessary .

Section A

- Q.1 Explain the following term 10
- a) Solubility
 - b) Nucleation
 - c) Magma
 - d) Distillate
 - e) Ideal plate.
- Q.2 07
- a) A mixture of benzene and toluene boils at 368 k under a pressure of 101.325kpa. Determine the composition of the boiling liquid assuming that mixture obeys Raoult's law. At 368 k, the vapour pressure of benzene is 155.56 kpa and that of toluene is 63.98 kpa .
 - b) With neat sketch explain fractioning column in distillation . 08
- Q.3 12
- a) How number of plates in distillation Colum is determined by . Ponchon and Savarit method?
 - b) Importance of q-line in location of feed in distillation Column 03
- Q.4 07
- a) What will be the yield of $Na_2S_2O_3 \cdot 5H_2O$ crystals when 100 kg of 48% $Ha_2S_2O_3$ solution is cooled to 293 k. Also calculate percentage yield of the crystals. Solubility of $Na_2S_2O_3$ is 70 parts per 100 parts water at 293k.
 - b) With neat sketch explain flash vaporization. Why it is called equilibrium distillation. 08
- Q.5 Write short note on 15
- a) Lewis and Sorel method
 - b) Location of feed point in distillation column
 - c) Solubility curves

Solution B

- Q.6 Explain the following term. 10
- a) Solubility envelope
 - b) Plait point
 - c) Lixiviation
 - d) Decoction
 - e) Distribution coefficient
- Q.7 Tests are made on the extraction of acetic acid from a dilute aqueous solution by means of a ketone in a small spray tower of diameter 46mm and effective height 1.09 m. the aqueous phase being run into the top of the tower. The ketone enters free from acid at a rate of $0.0014m^3/s$ and leaves with an acid concentration of $0.38 \text{ Kmol}/m^3$ The concentration in the aqueous phase falls from 1.19 to $0.82 \text{ Kmol}/m^3$. Calculate the overall extraction coefficient based on the concentration in ketone phase and the height of the corresponding overall transfer unit. The equilibrium conditions are expressed by concentration of acid in the ketone phase= 0.548 concentration in aq. phase. 15

- Q.8 a) With neat sketch explain multistage countercurrent extraction. 08
b) With neat sketch explain single stage leaching. 07
- Q.9 a) Explain the shanks system for multiple contact countercurrent system in leaching. 07
b) Explain the systems of three liquids one pair partially soluble and effect of temperature on it. 08
- Q.10 Write note on following 15
a) Notation scheme in liquid equilibrium
b) Filter – press leaching
c) Differential extractors.

SUBJECT CODE NO:- P-302
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Plant Design & Process Economics
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Question number 1 and 6 are compulsory.
 - ii) Answer any two questions from remaining of each section.
 - iii) Draw a well labeled diagram if necessary.

Section A

- Q.1 Answer the following 10
- a) What is sizing of a equipment?
 - b) Define cost index?
 - c) State importance of taxes in plant economics.
 - d) What are major steps in designing of new process?
 - e) What is an asset & liability?
- Q.2 a) State principle of similarity criteria. 05
b) Discuss in brief scale up process. 10
- Q.3 a) What are various techniques of layouting a process plant? 08
b) How site selection affects performance of a plant? 07
- Q.4 a) What are types of cost? 05
b) Describe insurances available for process plant? 10
- Q.5 Write short notes on (any three) 15
- a) Literature survey
 - b) Process utilities
 - c) Cost index
 - d) Pilot plant

Section B

- Q.6 Answer the following 10
- a) Define event with respect to project evaluation and review technique (PERT)
 - b) Define breakeven point
 - c) Explain the term optimum reflux ratio
 - d) What is float time?
 - e) Define rate of return
- Q.7 a) What are causes of depreciation? 05
b) Describe methods for calculating depreciation. 10
- Q.8 a) What is optimization? 08
b) Explain the technique of linear programming. 07

Q.9 An assemble is to be made from two part 'x' and 'y' Both parts must be turn lathe. Y must be polished, x need not be polished. Sequence of activities together with their predecessor is given below. Draw a network diagram. 15

Activity	Description	Predecessor Activity.
A	Open Work	-
B	Get material for X	A
C	Get material for Y	A
D	Then X on lathe	B
E	Then Y on lathe	B,C
F	Polish Y	E
G	Assemble X and Y	D,F
H	Pack	G

Q.10 a) What is the importance of network analysis techniques? 08
 b) What information is obtained from break even chart? 07

SUBJECT CODE NO:- P-367
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Chem) Examination May/June 2017
Chemical Process Industries
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B i) Q.No.1 and Q.No.6 are compulsory.
ii) Answer any two questions from the remaining questions in each section
- Section A
- Q.1 Answer the following 10
- 1) Phosphoric acid is used for -----
Fill in the blanks
 - 2) Oil of vitriol is -----
Fill in the blanks
 - 3) State the composition of water gas
 - 4) Name the catalyst used in manufacture of sulphuric acid by contact process
 - 5) Solvay process for manufacture of soda ash
 - a) Can use low grade brine
 - b) Require less electric power
 - c) Does not require NH₃ plant investment
 - d) All of these
- Q.2 a) Enlist the major challenges faced by chemical industries? 05
b) What responsibilities and difficulties you visualize in a production plant, as a production plant engineer? 10
- Q.3 a) Write a short note on : wet process phosphoric acid 05
b) Draw a flow sheet for production of urea . comment on the engineering aspect of the process 10
- Q.4 a) State the benefits associated with liquefaction of air 05
b) With a neat flow sheet, explain manufacture of soda ash 10
- Q.5 a) Membrane process for producing chlorine has less impact on environment. Justify the statement 05
b) What are industrial uses of water gas & producer gas? 05
c) Enlist properties of chlorine gas . 05
- Section B
- Q.6 Answer the following 10
- 1) Formation of soap involves -----
 - a) Esterification b) nitration
 - 2) Tallow refers to ----
 - a) Oil of animal origin b) mixture of oil
 - 3) Milk sugar is obtained from ----
 - a) Lactose b) Maltose
 - 4) Name the enzyme which converts starch to Maltose
 - 5) Name the process which use yeast as raw material
- Q.7 a) What is acetic acid? Why it is industrially important? 05
b) How phenol is made from Cumene ? 10

- Q.8 a) What is role of builders in detergents 05
b) Draw a flow diagram for manufacture of LDPE? Explain the process 10
- Q.9 a) What are source of natural rubber? 05
b) How absolute alcohol is made? 10
- Q.10 Write short notes on
a) Starch and its derivatives 05
b) Synthetic rubber 05
c) Application of PVC 05