**Total No. of Questions :4]**

**SEAT No. :** ____

**P1969**

**[Total No. of Pages :3**

# [4923]-45
# M.Sc. - II
# ANALYTICAL CHEMISTRY
## CH-391: Environmental and Analysis of Industrial Materials
## (2008 Pattern) (Semester - III)

***Time : 3 Hours]*** ***[Max. Marks :80***

***Instructions to the candidates:***

1) ***Answers to the two sections should be written in separate answer books.***
2) ***All questions are compulsory and carry equal marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Use of logarithmic tables, non-programmable calculators is allowed.***

## SECTION -I

***Q1)*** Attempt any four of the following: **[20]**

a) Explain the procedure for estimation of nitrogen from sample of urea.

b) Give an analytical procedure for determination of lead from sample of lead glass.

c) Explain the term cosmetics. Give the procedure for the estimation of magnesium from cosmetics.

d) Explain the term propellent and explosive. Describe analytical method for determination of calcium from propellant.

e) A sample of face powder weighing 2.25 gm was dissolved in acid & the solution was diluted to 250 ml. 50 ml aliquot was analysed for $SO_4^{2-}$ & it gave 0.300 gm of $BaSO_4$, calculate the percentage of sulphate & sulphur from given sample.

(Given: At.wt. Ba=137 , S=32, O=16)

***Q2)*** Attempt Any four of the following **[20]**

a) What is active ingradient of detergent? How it is determined?

***P.T.O.***

b) Define the terms:

i) Pigment

ii) Binder

iii) Vehicle

iv) Varnish

v) Flash point

c) Write a short note on quantitative test of explosives.

d) 0.5 gm sample containing $MnO_2$ is heated with conc. HCl liberating $Cl_2$. Then $Cl_2$ was passed through a solution of KI and 33.0 ml of 0.11 M $Na_2S_2O_3$ is required to titrate the liberated $I_2$. Calculate the percentage of $MnO_2$ in sample.

[Given: At. wt. I=127 , Mn=53.93, O=16]

e) 0.60 gm sample of ilemenite was fused with potassium persulphate and the mass was extracted with $H_2SO_4$ solution. After removal of insoluble matter the filtrate was diluted to 100 ml. From it an aliquot of 50 ml after removal of iron, Ti-cufferon complex was precipitated. After ignition of the precipitate 0.156 gm of titanium oxide was obtained. Calculate the percentage of $TiO_2$ & Ti in the given sample.

[Given: At. wt. Ti=47.88 , O=16]

## SECTION -II

***Q3)*** Attempt any four of the following: **[20]**

a) What is steel? Explain the analytical procedure for estimation of nickel from steel.

b) Explain the analytical method for estimation of $Al_2O_3$ from bauxite ore.

c) What are copper base alloys? Explain the method used for estimation of copper.

d) 4.250 gm of washing soda was dissolved in distilled water and diluted to 250 ml. A 25 ml aliquot of this solution titrated with 0.1 N HCl using methyl orange as an indicator and gave burette reading of 28 ml. Calculate the percentage of sodium carbonate in given sample.

[At. wt. Na=22.98 , C=12 , O=15.99]

e) Analysis of the component of 2.00 gm of shipnail, brass yielded 0.068 gm of $SnO_2$ & 0.280 gm of $PbSO_4$. Calculate percentage of each metal in alloy.

[Given: At.wt. Sn=118.7 , Pb=207.2 , O=16, S=32]

***Q4)*** Attempt <u>any four</u> of the following **[20]**

a) Give an account of estimation of dissolved oxygen.

b) Give note on electrostatic precipitator.

c) What is sludge? Give any two methods used for disposal of sludge.

d) Describe trickeling filter process.

e) Explain principle and construction of cyclone separator.