

**B.N. Bandodkar college of Science, Thane**  
**F.Y.B.Sc. II<sup>nd</sup> Semester examination 2013-2014**  
**USCH202**

Duration 2 hrs

Marks 60

N. B. :

1. All the questions are compulsory
2. Figures to the right indicates full marks
3. Use of log table/ non programmable calculator is allowed

Q.1 a Calculate molarity and molality of sulphuric acid solution of density  $1.198 \text{ gm/cm}^3$  containing 27% by mass of sulphuric acid. ( H=1, O=16, S=32 ) 4

OR

a What is meant by electromagnetic spectrum? Describe the various regions involved in electromagnetic spectrum. 4

b If 34.2gm of cane sugar was dissolved in water to prepare 214.2 gm of sugar syrup. Calculate molality and mole fraction of cane sugar in the syrup. ( C=12, O=16, H=1 ) 4

OR

b Explain the different ways in which matter interacts with electromagnetic radiations. 4

c Write any four characteristics of an ideal standard solutions. 4

OR

c Describe the different kinds of energies present in a molecule. 4

d Define Formality. If 12gm of sodium carbonate is dissolved in 100ml of the solution. Calculate i) formality of sodium carbonate ii) molarity of  $\text{Na}^+$  and  $\text{CO}_3^{2-}$  ions. ( Na=23, C=12, O=16 ) 3

OR

d Calculate the wave number ,frequency and energy of one quantum of radiation of wavelength  $10^4 \text{ nm}$  in joule. 3

Q. 2 a What are the properties and uses of silicones? 4

OR

a Explain inert pair effect with respect to group 14 elements. 4

b What are silicones? How linear silicones prepared? 4

OR

b Give electronic configuration of elements of group 14. 4

c Write a note on green house effect. 4

OR

c Explain the methods of controlling the concentration of nitric oxide in atmosphere. 4

d Write a note on depletion of ozone layer. 3

OR

d Discuss the sources of emission of carbon monoxide in atmosphere. 3

Q. 3 a What is the action of aq KOH on i) ethyl bromide ii) n- propyl chloride. 4

OR

a How will you convert ethyl cyanide into 4

i) propyl amide ii) propionic acid

PTO

- b Explain the oxidation of alcohol and how primary, secondary and tertiary alcohol can be distinguished? 4
- OR
- b Explain the following reaction with suitable example 4  
i) Wurtz reaction ii) aldol condensation
- c What is the action of ethyl magnesium bromide on the following compound. 4  
i) formaldehyde ii) acetone
- OR
- c How will you convert 4  
i) propanol  $\rightarrow$  1-chloro propane  
ii) ethanol  $\rightarrow$  ethyl chloride
- d Explain the salt formation in acid. 3
- OR
- d Explain the action of HCN on aldehyde and ketone 3
- Q. 4 A a Define Milliequivalent. How many equivalents and milliequivalents of HCl are present in 50ml of a 0.1N solution? 3
- OR
- a Discuss the characteristics of electromagnetic radiations. 3
- b Calculate the weight of the sulphuric acid that will be required to prepare 500ml of 0.1N solution. 2
- OR
- b Define the terms : 2  
i) Wavelength ii) Frequency.
- B a Discuss the role of sodium in biological system. 3
- OR
- a Write the names of essential and non essential elements? 3
- b Discuss the role of potassium in biological system. 2
- OR
- b Mention the diseases caused by deficiency of iron and iodine. 2
- C a Distinguish between aromatic and aliphatic compounds. 2
- OR
- a Draw the structure of anthracene and phenanthrene. 2
- b Complete the reactions. 2  
Ketone + hydroxylamine  $\rightarrow$
- OR
- b Ketone + HCN  $\rightarrow$  2
- c Complete the reactions. 1  
Ethanol +  $\text{PCl}_5 \rightarrow$
- OR
- c Explain the amide formation by using acid. 1

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