

B. N. Bandodkar College of Science, Thane
Junior College
S.Y.J.C. 1st Term Examination, October 2014
Subject – Chemistry I and II

Day: Saturday
Date: 18/10/2014

Time: 11.00 am to 01.00 pm
Max. Marks: 50

- Note: 1) Answer to the two sections should be written on the same answer books.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagrams and write chemically balanced equations wherever required.
4) Use of log tables is allowed.

Section – I

Q.1 Select and write the most appropriate answer from the given alternatives for each sub question: **05**

- 1) Molar conductivity of both strong and weak electrolytes _____ with dilution.
a) Decrease rapidly b) Increase c) Remain same d) Slightly decrease
- 2) For a reaction ΔS is negative and ΔH is negative then the reaction is _____
a) Spontaneous at low temperatures only b) Non-spontaneous at low temperatures only
c) Spontaneous at all temperatures d) Non-spontaneous at high temperatures
- 3) If the enthalpy of formation of methane is -74.8 KJ, then the enthalpy of formation of 32 g of methane is _____
a) -74.8 KJ b) +74.8 KJ c) +149.6 KJ d) -149.6 KJ
- 4) Which of the following aqueous solutions will have minimum elevation in boiling point?
a) 0.1 M KCl b) 0.05 M NaCl c) 1 M AlPO_4 d) 0.1 M MgSO_4
- 5) The relation between Van't Hoff factor and degree of dissociation is given as _____
a) $\alpha = \frac{i-1}{n'+1}$ b) $i = \frac{\alpha-1}{n'-1}$ c) $i = 1 + (n-1)\alpha$ d) $\alpha = 1 + (n' - 1)i$

Q.2 Attempt any Four of the following: **08**

- 1) Distinguish between electrolytic cell and galvanic cell.
- 2) Calculate Molarity and Molality of sulphuric acid solution of density 1.198 g cm^{-3} containing 27 % by mass of sulphuric acid (Molar mass of $\text{H}_2\text{SO}_4 = 98 \text{ g mol}^{-1}$)
- 3) State second law of thermodynamics in terms of entropy and express it mathematically.
- 4) Derive relationship between ΔG and ΔS_{total} .
- 5) Derive relationship between molar mass of solute and relative lowering of vapour pressure.
- 6) Distinguish between isothermal process and adiabatic process.

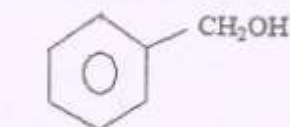
Q.3 Attempt any Four of the following: **12**

- 1) Explain Kohlrausch's law of independent migration of ions. Explain its application.
- 2) 0.12 molal aqueous solution of a substance boils at 373.21 K. Calculate molal elevation constant of the solvent. (Boiling point of water = 373.15 K).
- 3) State rate law. Derive the integrated equation for first order reaction.
- 4) The standard enthalpy of formation of $\text{CO}_2(\text{g})$, $\text{H}_2\text{O}(\text{l})$ are - 390 KJ/mol and -280 KJ/mol. Calculate the standard enthalpy of formation of ethane, if standard enthalpy of combustion of ethane is - 1536 KJ/mol.
- 5) Define and explain: 1) Standard enthalpy of formation 2) Enthalpy of fusion
- 6) State Faraday's first law of electrolysis. How many Faraday's of electricity are required to produce 5g of Mg from MgCl_2 (Molar mass of Mg = 24 g/mol).

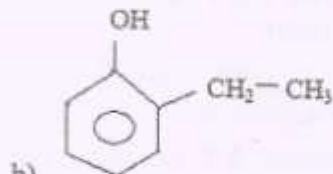
Section - II

Q.4 Select and write the most appropriate answer from the given alternatives for each sub question: 05

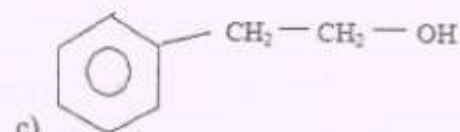
- Sodium metal does not react with
 - C_2H_5OH
 - C_2H_5COOH
 - $(CH_3)_2O$
 - $CH_3-\underset{\substack{| \\ OH}}{CH}-CH_3$
- Ethyl alcohol when refluxed with $SOCl_2$ in presence of pyridine followed by treatment with silver cyanide forms
 - Ethyl cyanide
 - Ethyl isocyanide
 - Ethyl chloride
 - Ethylamine
- The structural formula of 2-phenyl ethanol is



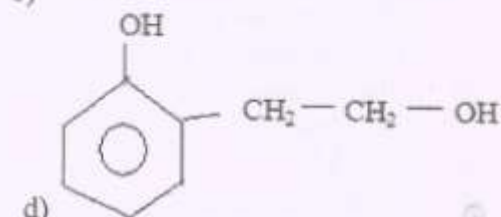
a)



b)

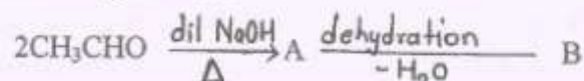


c)



d)

- The C-X bond in aryl halide is
 - Shorter in length and stronger than in alkyl halides
 - Longer in length and weaker than in alkyl halides
 - Shorter in length and weaker than in alkyl halides
 - Longer in length and stronger than in alkyl halides
- Identify 'B' from following reaction

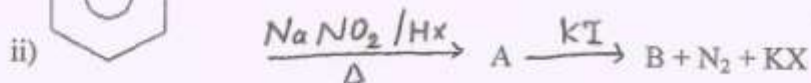
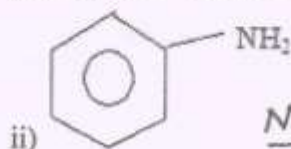
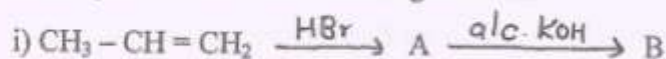


- $CH_3CH(OH)-CH_2CHO$
- $CH_3-CH=CH-CHO$
- CH_3COCH_3
- $(CH_3CO)_2O$

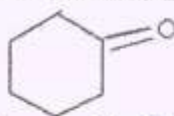
Q.5 Attempt any Four of the following:

08

- Write a short note on 'Haloform reaction'.
- Write down the structure of α -D (+) Glucopyranose and β -D (-) Fructofuranose
- Explain O-nitrophenol is more acidic than O-Cresol.
- Identify A and B in the following reaction.



- 5) a) What is the hydrolysis product of Lactose?
b) Write down the reaction for the Laboratory preparation of Glucose.
- 6) Write down the structure of the products obtained from



by action of hydrazine in presence of: a) Acidic medium b) Strong Base

Q.6

Attempt any Four of the following:

12

- 1) What is the action of the following on Glucose
a) Br_2 water b) hydroxylamine c) hot HI
- 2) How Benzaldehyde is prepared using
a) Toluene b) Benzene c) Benzoyl chloride
- 3) Explain SN^2 reaction mechanism with suitable example with the help of Energy profile diagram
- 4) How will you convert
a) Alcohol to Benzoic acid
b) Alkyl dibromide to propanol
c) Calcium carboxylate to propionaldehyde
- 5) Write down the mechanism of hydration of Ethylene.
- 6) a) What are reducing and non – reducing sugar?
b) Write a note on Wurtz fitting reaction.

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