

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)

CLASS: IMSC  
BRANCH: PHYSICS

SEMESTER: III  
SESSION: MO/2022

SUBJECT: CH213 CHEMISTRY-II

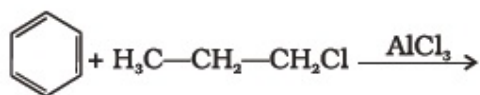
TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 25.
  2. Candidates attempt for all 25 marks.
  3. Before attempting the question paper, be sure that you have got the correct question paper.
  4. The missing data, if any, may be assumed suitably.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q1 (a)	Write down the different postulates of Kinetic molecular theory of gases. Explain only the kinetic gas equation.	[2] CO1	2
Q1 (b)	Write down the final expression for Maxwell distribution of molecular velocities in one and two dimensions with significance of symbols used. Explain the plot between the fraction of molecules and their velocity.	[3] CO1	2
Q2 (a)	Water is a self-ionizing solvent. Comment. Can you give example of another such self-ionizing solvent?	[2] CO3	3
Q2 (b)	Derive 'Oswald's dilution law'. Briefly discuss its significance.	[3] CO3	3
Q3 (a)	The 'K <sub>w</sub> ' of pure water at 40°C is double that at 25°C. Calculate the pH of pure water at 40°C. A solution at 40°C is having pH of 7. Comment whether the solution is acidic, neutral or basic.	[2] CO3	3
Q3 (b)	Excluded volume per molecule is four times the actual volume of the gas. Prove it. Show the effect of temperature on deviations from ideal behavior.	[3] CO1	3
Q4 (a)	What do you mean by true and potential electrolytes? Elaborate with suitable examples.	[2] CO3	2
Q4 (b)	Explain the addition vs. substitution reaction of benzene with bromine using proper energy diagram.	[3] CO1	1
Q5 (a)	Explain the fact that halogens are o- and p-directing but deactivating towards electrophilic substitution of halogenated benzene.	[2] CO1	4
Q5 (b)	What will be the (expected and observed) product(s) obtained as a result of the following reaction and why?	[3] CO2	3



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