

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, Nov.-Dec. 2015

B. Tech in Chemical Engineering, Semester-III

Roll No.....

COURSE CODE: (CHE-304); Unit Processes in
Organic Synthesis

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	A Bond angle of water is (a) 104 (b) 109 (c) 104.5 (d) 104.25	
ii.	Which one compound contains chiral carbon a) dichloro-dinitromethane b) carbon tetra chloride c) bromo ethanol d) None	
iii.	A catalyst increases the rate of a reaction by a) decreasing the heat of reaction b) increase the kinetic energy c) providing an alternated reaction path d) change the molecular structure of reactant	
iv.	In SN1 mechanism, the rate determining step is the a) slowest and the lowest activation energy b) slowest and the highest activation energy c) fastest and has the lower activation energy d) None	
v.	The most common cause of alkalinity in water due to a) HCO_3^- ions b) Cl^- ions c) NH_4^+ d) all of the above	
vi	Sp^3d hybridization gives the structure of the molecule a) tetrahedral b) trigonal bi pyramidal c) square planer d) linear	
vii	Proton NMR technique use for determination of a) total number of proton present in compound b) total number of carbon present in compound c) Axial and equitorial proton in compound d) all of the above	
viii	UV spectroscopy is used for the determination of a) conjugation in molecule b) to distinction of conjugated and non-conjugated compounds c) both a & b d) to determine the functional group in molecule	
ix	The Fractional method used for (a) separation of two liquids which possess very close boiling point (b) A liquids which has high boiling point (c) two liquids which possess same BP (d) none	
x	Invert Umbrella effect obtain in a) SN_1 reaction b) SN_2 reaction c) Both a& b d) S_{Ni} reaction	

Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
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i.	Explain the conformations with suitable example.	
ii.	Short note on bathochromic shift with diagram and example.	
iii.	Write only chemical reaction and mechanism of Friedal craft reaction.	
iv.	What is the temporary hardness of water how this hardness removes by boiling method give all chemical reactions?	

Q.3A	Explain Vulcanization of natural rubber	05
Q.3B	The velocity constant for the decomposition of NO is 5.16×10^4 at 1125K and 3.76×10^3 at 1085k . Calculate the energy of reaction.	05

Q.4A	Discuss the industrial application of heterogeneous catalyst.	05
Q.4B	Short note on a) optical isomerism b) Meso compounds	05

Q.5A	Write note on temperature dependent kinetic rate and calculate the activation energy of reaction.	05
Q.5B	Explain the SN2 reaction with suitable example.	05

Q.6A	Write short note on paper chromatography with neat diagram	05
Q.6B	At 300k a first order reaction is 50% completed in 20 minutes. At 350k the same reaction is 50% completed in 5 minutes. Calculate the energy of activation of the reaction.	05
	OR	
Q.6B	Discuss the BeCl ₂ molecule on the basis of hybridization.	05

Q.7A	Draw the energy level diagram for oxygen molecule.	05
Q.7B	Write short note on bonding and anti bonding orbital with suitable example.	05
	OR	
Q.7B	What is ion exchange resin? Discuss their application in water softening.	05

Q.8A	Explain the schrodinger wave equation for the probability of finding electron.	10
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Q.9A	Note on : A) crystallization b) Fractional crystallization's	10
Q.9B	What is condensation polymer ? Discuss Bakelite polymer with chemical reaction	10
	OR	
Q.9B	Give full note on metallic corrosion and its prevention.	10