KATHMANDU UNIVERSITY
End Semester Examination [C]
June 2018

Marks Scored:

Level : B.Sc.
Year : II

Course : CHEM 207
Semester: I

Exam Roll No. Time : 30 mins. F.M. : 20

Registration No.: Date JUN 15 2018

SECTION "A"
[20Q.×1=20 marks]

I. Select the most appropriate answer.

1. Which is the most common product of the reaction between HBr and 3-methylpent-2-ene in presence of peroxide?
[ ] 2,3-dibromo-3-methylpentane [ ] 2-bromo-3-methylpentane
[ ] 2,4-dibromo-3-methylpentane [ ] 3-bromo-3-methylpentan

2. In electrophilic aromatic substitution reaction which of the following is activating and ortho- para directing group?
[ ] $-NH_2$ [ ] $-NO_2$ [ ] $-CH_3$ [ ] –I

3. Addition of $NH_3$/ Na with alkynes produce
[ ] trans-alkene [ ] cis-alkenes
[ ] both cis and trans alkenes [ ] alkanes

4. Primary alcohols on oxidation produce.....
[ ] Ether [ ] Ester [ ] Carboxylic acid [ ] aldehyes

5. Which of the following does not undergoes Aldol condensation reaction?
[ ] methanal [ ] ethanal [ ] propanone [ ] butanal

6. The correct order of basicity of amines
[ ] secondary > primary > tertiary [ ] primary>secondary> tertiary
[ ] tertiary >secondary> primary [ ] primary> tertiary > secondary

7. Anionic polymerization is catalysed by
[ ] an acid [ ] a base [ ] peroxide [ ] hydrazine

8. At Isoelectric point is amino acid are in..... form.
[ ] neutal [ ] cationic [ ] an anionic [ ] dipolar

9. What is the correct name for the compound $CH_3CH_2CH(CH_3)CH(Br)CH_2CH_3$?
[ ] 1-bromo-2-ethyl hexane [ ] 4-bromo-3-ethyl hexane
[ ] 3-bromo-4-ethyl hexane [ ] 4-ethyl -3-bromo hexane

10. In the mechanism of Chymotrypsin enzyme, the second step involve.....
[ ] hydrolysis [ ] ammonolysis [ ] alcoholysis [ ] solvolysis

11. Identify the incorrect statement regarding Benzene
[ ] It has $sp^3$ hybridized carbons
[ ] It is aromatic Compound
[ ] It undergoes elecrophilic substitution reactions
[ ] It undergoesnucleophilic substitution reactions

12. Which is true about the coordination polymerization?
[ ] It gives nonlinear polymers [ ] It produces branched polymers
[ ] It permits stereochemical control [ ] It uses Lindar catalyst

13. Acids anhydrides on reaction with alcohols produce .....
[ ] Ester and alcohols [ ] Ester and Carboxylic acid
[ ] Ether and Ester [ ] Ester only

14. Reaction of .....amines with nitrous acid produce diazonium salts.
[ ] primary [ ] secondary [ ] tertiary [ ] quaternary

15. In a free radical reaction, free radicals react with each other to form neural molecules at
[ ] initiation step [ ] propagation step
[ ] initiation and propagation steps [ ] termination step

II. Fill in the blanks with appropriate words/symbols.

16. Reaction of ..... amines with nitrous acid produce p-nitrosocompound.

17. The solvent generally used during the preparation of organometallic compounds is.....

18. The structural formula of 2-methyalcyclopentanol is.....

19. The product formed by the Sulphonation of Benzene is.....(draw structural formula)

20. Grignard reagents react with Benzaldehyde followed by hydrolysis produce ..... (draw structural formula)

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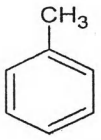
SECTION "B"

*Attempt ALL questions.*

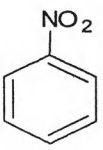
1.a. Give product/s for the following reactions. [5×1=5]

i. $H_3C—CH=CH_2 + HBr \xrightarrow{\text{peroxide}} ?$

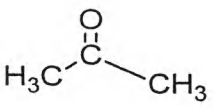
ii. 

$\xrightarrow{H_2SO_4}$ ?

iii. $C_2H_5MgBr + CH_3COH \xrightarrow{H_2O} ?$

iv. 

$\xrightarrow[AlCl_3]{C_2H_5Cl}$ ?

v. 

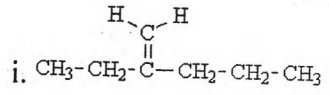
$\xrightarrow[ii)\ H_2O]{i)NaCN}$ ?

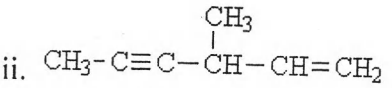
b. Write the chemical reactions for the conversion of Cyclopentanone to [2]
i. Cyclopetanol ii. Cyclopentane

c. Give structures and names of the principal organic products expected from the reaction of ammonia with a propanoic acid and an acylhalide. [2]

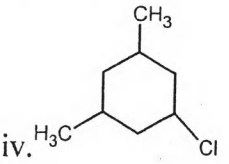
2.a. Draw structural formulas of [4×1=4]
i. 2-methoxypentane
ii. 4-hydroxyl 3-methylpentanone
iii. 3-bromo 2,2,4-trichlorononane
iv. 1-ethylcyclopentanol

b . Write the IUPAC nomenclature for the followings. [4×1=4]

i. 

ii. 

iii. 

iv. 

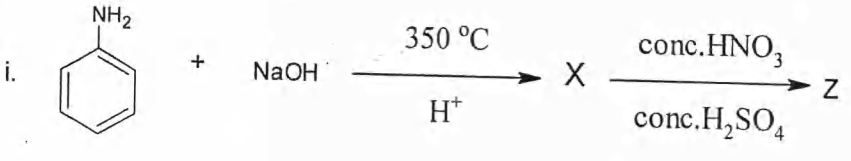
3. Explain with appropriate reasons. [4×2.5=10]

a. $-NO_2$ is the deactivating and meta directing group during electrophilic aromatic substitution reaction.
b. Tertiary carbcation is more stable than primary carbocation.
c. Aryl halides are less reactive than akyl halides toward nucleophilic aromatic substitution.
d. $SN_2$ reaction the order of reactivity of haloalkanes isprimary>secondary>tertiary.

4. Write down the mechanism of the following reactions with suitable example. [4×2.5=10]

a. Free radical Polymerization
b. Mechanism of chymotripsin enzyme
c. Aldol condensation
d. Canizzaros reaction

5. Assign structures to the compounds represented by the letters for the following series of reactions. [4×2=8]

i. 

ii. $CH_3CH_2OH \xrightarrow{\text{Pyridinium chlorochromate}} X \xrightarrow{KMnO_4} Z$

iii. $CH_3CH_2OH + C_2H_5COOH \xrightarrow{H^+} X \xrightarrow{CH_3MgBr} Z$

iv. $CH_3COOH \xrightarrow{PCl_5} X \xrightarrow{(CH_3)_2NH} Z$

6. Write short notes on [4×2.5=10]

a. Coaltar distillation
b. Isoelecric point
c. condensation polymerization
d. proteins