Marks Scored:

KATHMANDU UNIVERSITY
End Semester Examination
February/March 2018

Level : B. Sc
Year : II
Course : CHEM 207
Semester: I
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No.:
Date : MAR 2 0 2018

SECTION "A"
[ 20 Q × 1= 20 marks]

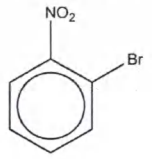
I. Select the most appropriate answer.

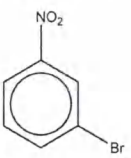
1. What is the correct name for the compound $CH_3CH_2CH(CH_3)CH(OH)CH_3$?
[ ] 2-ethylbutan-3-ol [ ] 3-ethylbutan-2-ol
[ ] 2-methylpentan-3-ol [ ] 3-methylpentan-2-ol

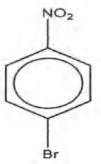
2. In a free radical reaction free radicals are formed at
[ ] In initiation step [ ] in propagation step
[ ] in termination step [ ] In initiation and propagation steps

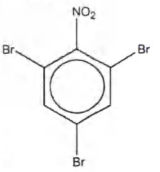
3. Which is the most common product of the reaction between HBr and 3-methylpent-2-ene?
[ ] 2,3-dibromo-3-methylpentane [ ] 2-bromo-3-methylpentane
[ ] 2,4-dibromo-3-methylpentane [ ] 3-bromo-3-methylpentane

4. Which is the correct product formed from the bromination of nitrobenzene?

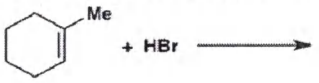
[ ] 

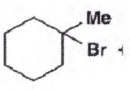
[ ] 

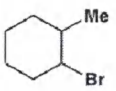
[ ] 

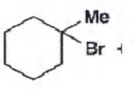
[ ] 

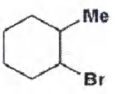

5. In the given reaction ,the product/s formed is/are in presence of peroxide




[ ] 

[ ] 

[ ] 

[ ] none 


6. Addition of $H_2$ in alkynes in the presence of Lindar catalyst produce
[ ] trans-alkene [ ] cis-alkenes
[ ] both cis and trans alkenes [ ] alkanes

7. Ketones are products formed by the oxidation of.....
[ ] primary alcohols [ ] secondary alcohols
[ ] tertiary alcohols [ ] aldehyes

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

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

10. Cationic polymerization is catalysed by
[ ] an acid [ ] a base [ ] peroxide [ ] hydrazine

11. Isoelectric point is referred to.....
[ ] end point [ ] voltage [ ] pH value [ ] concentration

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

13. Which is not true about the coordination polymerization?
[ ] It gives linear polymers [ ] It produces branched polymers
[ ] It permits stereochemical control [ ] It uses Ziegler -Natta catalyst

14. Acids anhydrides on reaction with alcohols produce .....
[ ] Ester and alcohols [ ] Ester and Carboxylic acis
[ ] Ether and Ester [ ] Ester only

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

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

16. Oxymercuration-demercuration reaction of alkenes has ..... orientation.

17. Hex-3-yne can be converted to trans-hex-3-ene by using ----------catalyst.

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

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

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

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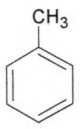
SECTION "B"
[5Q × 1 = 5 marks]

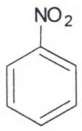
Attempt *ALL* questions.

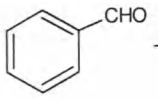
1. a. Give product/s for the following reactions. [5 × 1 =5]

i. $H_3C—CH=CH_2 + O_3 \longrightarrow ?$

ii.  $+ H_3C—Cl \xrightarrow{AlCl_3} ?$

iii. $C_2H_5MgBr + C_6H_5CHO \xrightarrow{H_2O} ?$

iv.  $\xrightarrow[Conc.H_2SO_4]{Conc.HNO_3} ?$

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

b. Starting with benzene, outline steps in a possible synthesis of *meta*-bromonitrobenzene and *ortho*-bromonitrobenzene and para-bromonitrobenzene. [2]

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

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

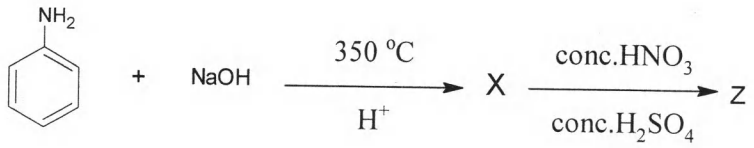
b. Write with examples. [2 × 2 = 4]
i. Stability of carbocation
ii. Aromatic compounds

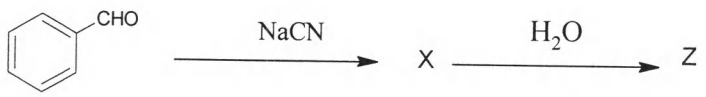
3. Explain with appropriate reasons. [2.5 × 4 = 10]
a. Dehydration of alcohols follows the order of reactivity as
Tertiary alcohols >secondary alcohols > primary alcohols
b. -OH is the activating and ortho,para directing group during electrophilic aromatic substitution reaction.

c. Aryl halides are less reactive than akyl halides toward nucleophilic aromatic substitution.
d. $SN_2$ reaction proceeds with inversion of configuration.

4. Write down the mechanism of the following reactions with suitable example. [2 .5 × 4 = 10]
a. Coordination Polymerization
b. Mechanism of chymotripsin enzyme
c. Aldol condensation
d. Elecrophic sustitution on Benzene

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

i. 


ii. 


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 [2 × 5 = 10]
a. Fibres and elastomers
b. Amino acids
c. Coaltar distillation
d. Isoelecric point
e. condensation polymerization