

20-3-17



DOON UNIVERSITY, DEHRADUN

Mid Sem Examination, Second Semester, 2016-2017
School of Physical Sciences (SoPS)
Integrated M.Sc. 5 Years (Chemistry)

Dated: 20 Mar 2017 (Monday)

Course: Org. Chem. I: Basics and Hydrocarbons

Course Code: CYC-151

Time Allowed: 2Hours

Maximum Marks: 30

Note: Attempt All Questions from Sections A,B,C.

SECTION: A

(Marks: 6)

[1] Write the IUPAC names of following compounds:

[1]

(a)		(b)	
(c)		(d)	

[2] Write down four different conditions when homolytic fission of a covalent bond is favoured. [1]

[3] What is inductive effect? Describe the factor which is responsible for the electron donating property of an alkyl group? [1]

[4] Write the hybridization of carbon of methyl carbocation, methyl carbanion and methyl free radical. [1]

[5] Is the statement "All nucleophiles are in general Lewis-bases" True or False? Explain the reason. [1]

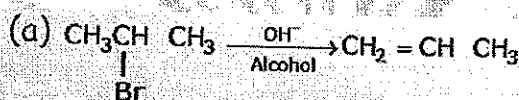
[6] Which one will be more acidic between protonated pyrrole and protonated pyridine? Also explain the reason. [1]

SECTION: B

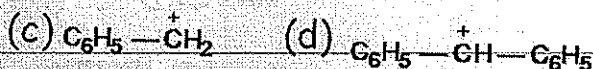
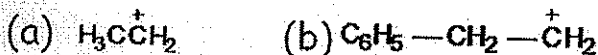
(Marks: 12)

[7] Arrange 3° , 2° , 1° , *Benzylic*, *Vinylic*, *Allylic*, and *Methyl* carbocations in decreasing order of stabilities. Also explain the reasons in detail. [2]

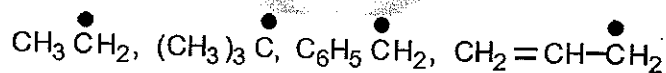
[8] Write the type of the reaction for each of the following: Also explain the reasons in brief. [2]



[9] (a) Which of the following is the least stable carbonium ion. Explain the reason. [1]



(b) Arrange the following in decreasing order of stability. Also explain reason. [1]

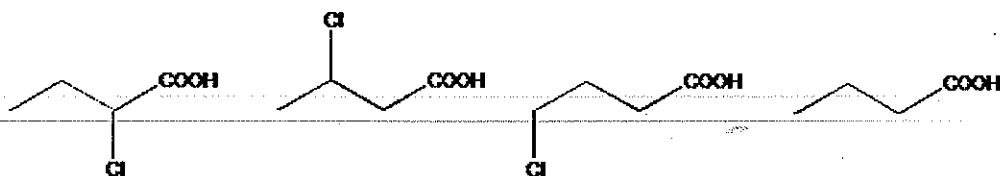


[10] (a) Arrange ethylene, ethane and acetylene in decreasing order of their acidic strength. Also explain the reason for the same. [1]

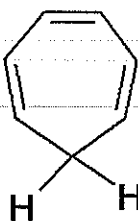
(b) Which one is least acidic among *acetic acid*, *phenol* and *n-propyl alcohol*? Also Explain the reason. [1]

[11] (a) What is the difference between the stability of acetate ion and phenoxide ion? [1]

(b) Arrange the following in decreasing order of their acidity. Explain reason. [1]



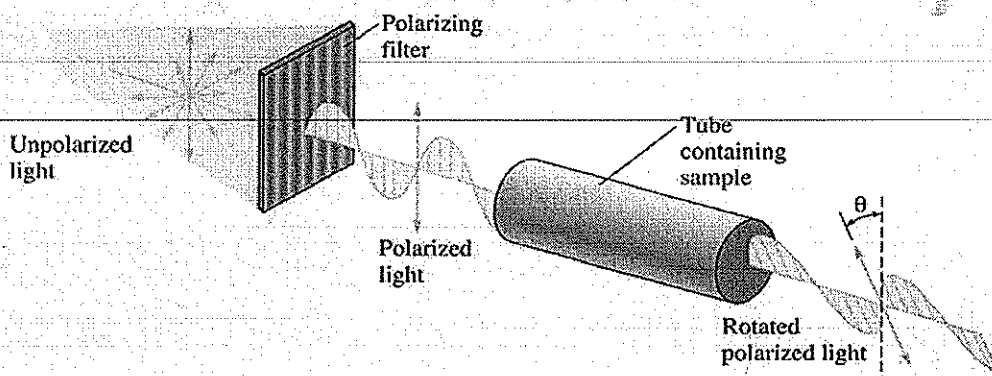
- [12] (a) Formation of cyclopentadienyl anion occurs but formation of cyclopentadienyl cation does not occur. Explain the reason. [1]
- (b) Write in context of aromatic or non-aromatic behavior of the following compounds with reasons. [1]



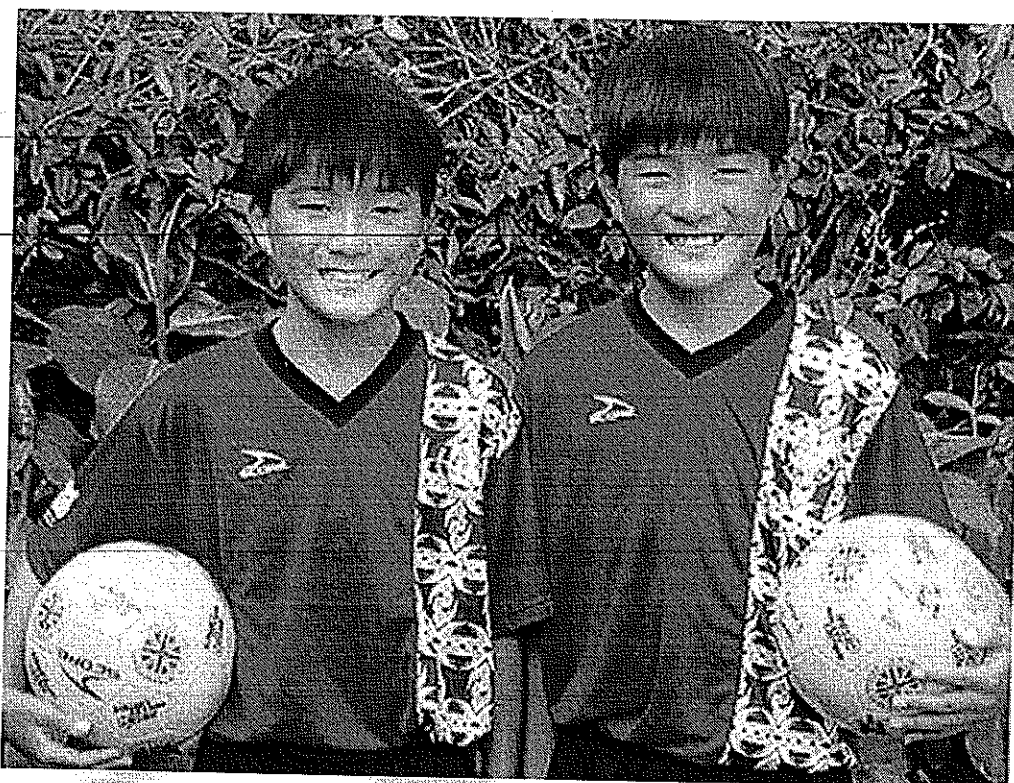
SECTION: C

(Marks: 12)

- [13] (a) Explain nucleophiles, electrophiles and carbenes with suitable examples. [3]
- (b) Explain Huckel's Rule in detail. [1]
- (c) What is the difference between basicity of aniline and methyl amine? Also explain the reason. [1]
- (d) Is the compound present in sample tube (below mentioned image) compound laevorotatory or dextrorotatory? [1/2]

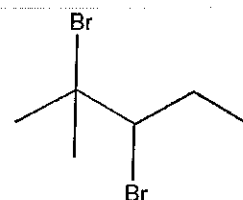
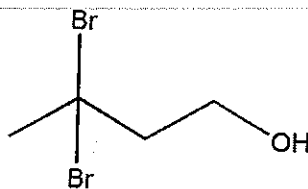
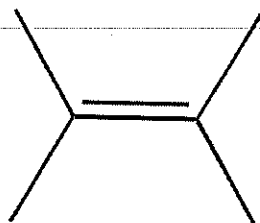


- (e) What is specific rotation? [1/2]
- [14] (a) Below mentioned images are superimposable or non-superimposable? [1/2]

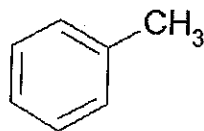
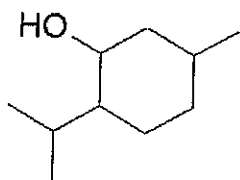


(b) Which type of carbon atom(s) are not chiral? [1/2]

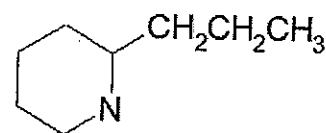
(c) Indicate the asymmetric carbon atom(s) in each of the following molecules. Which of them is/are optically active? [1/2]



(d) Indicate the asymmetric carbon atom(s) in each of the following molecules. Which of them is/are optically active? [1/2]



Toluene



Coniine

(e) What is the relationship between *R*, *S* and *d*, *l*? Explain. [1]

(f) Which type of compounds show Geometrical Isomerism? Also write the criterion for a compound to show geometrical isomerism. Explain the difference between diastereoisomerism and enantiomerism? [1+1+1]