Seat No. : _____

AC-153

April-2019

M.Sc., Sem.-II

408 : Organic Chemistry

Time : 2:30 Hours] **[Max. Marks : 70**

1. (A) (i) Define Chemical shift. Discuss the chemical shift of olefinic, alkyne and carbonyl compounds in ^{13}C NMR. **7**

(ii) Identify the compound on the basis of the spectral data presented here. **7**

UV : 243 and 280 nm

IR : 3300, 3000, 1670, 1650, 1510 cm^{-1}

NMR : 1.3 (3H), 2.1 (3H), 4.0 (2H), 6.8, 7.3 d (4H), 7.6 (1H)

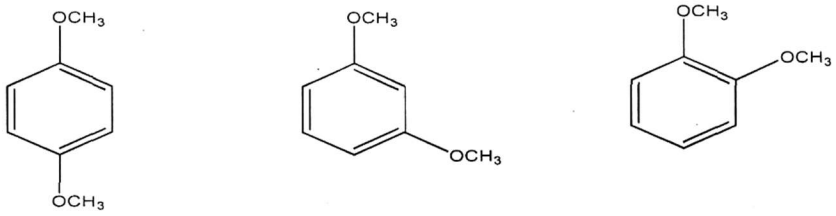
CNMR : 14.8, 24.2, 63.7, 114.7, 122.0, 131.0, 155.8, 168.5

Mass: 179, 137, 43, 29, 27

OR

(i) Give the similarities and dissimilarities between ^{1}H NMR and ^{13}C NMR.

(ii) Discuss the McLafferty rearrangements in Mass Spectroscopy and how will you differentiate among the following three compounds ?



(B) Answer in **one** or **two** lines : (any **four** out of **six**) **4**

(i) Discuss shielding and deshielding in ^{13}C NMR.

(ii) Define the principle of the Mass Spectroscopy.

(iii) Give the fragmentation of toluene.

(iv) Define Nitrogen rule.

(v) What do you mean by fast atom bombardment (FAB) ?

(vi) Give the empirical formula to calculate the chemical shift in straight chain of alkanes in ^{13}C NMR.

2. (A) (i) Discuss the Jablonski diagram and explain the terms involved in. **7**

(ii) Write any two synthesis and two important reactions of Pyrimidine and Benzothiazole. **7**

OR

(i) Explain Norrish type I and Norrish type II reactions with suitable examples.

(ii) Write any two synthesis and two important reactions of Pyrazole and Cinnoline.

(B) Answer in **one** or **two** lines : (any **four** out of **six**) **4**

(i) What is Photosensitization ?

(ii) Define bioluminescence.

(iii) Write general reaction of Paterno- Buchi reaction.

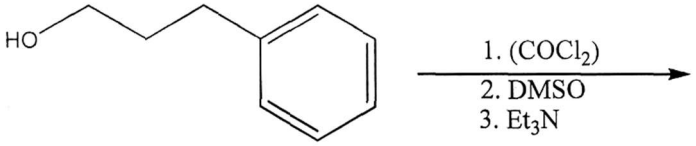
(iv) Draw the structure of Quinoxaline.

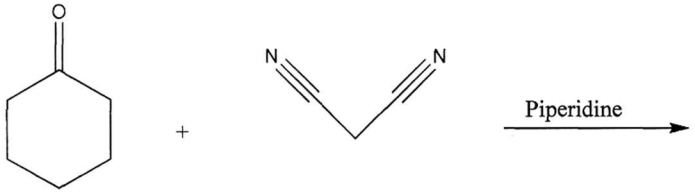
(v) Give the nitration of Thizaole.

(vi) Write any two applications of Pyridazine.

3. (A) (i) Give principle, general reaction, mechanism, two applications and disadvantages of Vilsmeier- Haack reaction. **7**

(ii) Complete the reaction with its mechanism : **7**

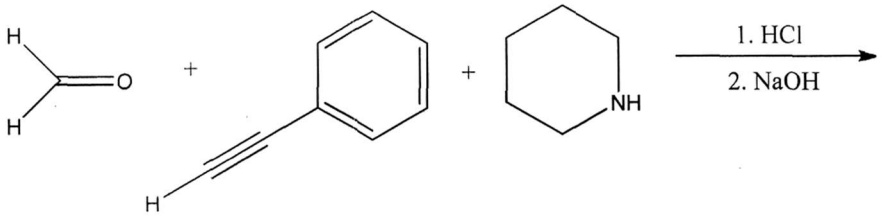
(1) 

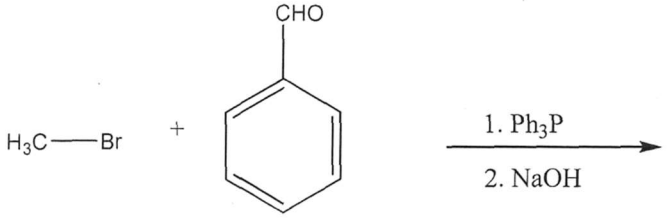
(2) 

OR

(i) Give principle, general reaction, mechanism, any two applications and disadvantages of Knovangel reaction.

(ii) Complete the reaction with its mechanism :

(1) 

(2) 

(B) Answer in **one** or **two** lines : (any **three** out of **five**) **3**

(i) What is Jones reagent ?

(ii) Give the general reaction of Sonogashira Coupling.

(iii) Give principle of Dickmann Reaction.

(iv) Write merits and demerits of Birch reduction.

(v) Give applications of Mitsunobu reaction.

4. (A) (i) Discuss selectivity, mechanism and three utilizations of DCC and Sodium cyanoborohydride. **7**

(ii) Discuss selectivity, mechanism and three utilizations of DIBAL-H and PTC. **7**

OR

(i) Discuss selectivity, mechanism and three utilizations of Dess-Martin Periodinane and Lithium Diisopropylamide (LDA).

(ii) Discuss selectivity, mechanism and three utilizations of 1,3-Dithiane and Sodium borohydride.

(B) Answer in **one** or **two** lines : (any **three** out of **five**) **3**

(i) Give two applications of DDQ.

(ii) What is specialty of n-Butyl lithium.

(iii) Write a structure and synthesis of Gilman's reagent.

(iv) What do you mean by Umpolung ?

(v) Why Grignard reagent used in the anhydrous condition ?

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