

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)

CLASS: IMSC  
BRANCH: CHEMISTRY

SEMESTER: VI  
SESSION : SP/2019

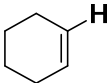
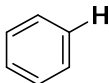
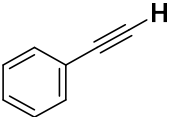
SUBJECT : IMC6005 ORGANIC CHEMISTRY-III

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
  2. Candidates may attempt for all 30 marks.
  3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. The missing data, if any, may be assumed suitably.
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- Q1 (a) Write down the fundamental Equation of NMR and discuss the relation between radio frequency and applied magnetic field. [2]  
(b) Why TMS is preferred choice to use as reference for NMR Samples. The observed chemical shift of a proton is 912 Hz from TMS and the operating frequency of the spectrometer is 400 MHz. Calculate the chemical shift in terms of  $\delta$  (ppm). [3]
- Q2 (a) Draw a representative  $^1\text{H}$  NMR spectrum for ethyl alcohol showing signals in the order of their appearance along with their splitting. [2]  
(b) Suggest the approximate chemical shift ( $\delta$ ) in  $^1\text{H}$  NMR for the highlighted hydrogen in the following compounds: [3]
- i)  ii)  iii) 
- Q3 (a) What is the different type of excitation shown by carbonyl compounds? [2]  
(b) Discuss singlet, doublet and triplet spin multiplicity with one example of each. [3]
- Q4 (a) Define vibrational cascade. [2]  
(b) Describe fluorescence with a neat diagram. [3]
- Q5 (a) Why electrophilic substitution in pyrrole is favored at C-2 position? [2]  
(b) Discuss the mechanism involved in Paal-Knorr pyrrole synthesis. [3]
- Q6 (a) Write the product formed when pentosan is treated with hot dil  $\text{H}_2\text{SO}_4$ . [2]  
(b) Write one method for synthesis of thiophene. [3]

::: 05/03/2019 :::::E