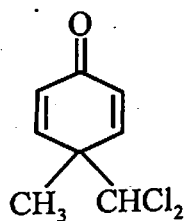


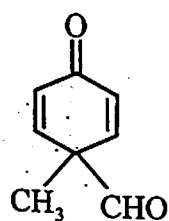
U.G. 3rd Semester Examination-2024**CHEMISTRY****[HONOURS]****Course Code : CHEM-H-CC-T-7****(Organic-III)****[CBCS]****Full Marks : 40****Time : 2½ Hours***The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***1. Answer any five from the following questions:****2×5=10**

- a) Hydrogenation of alkene is an exothermic process, still it requires a catalyst— explain.
- b) Preparation of allylmagnesium chloride can not be made in good yield in concentrated solution.
- c) Explain: NH_2NH_2 is a stronger nucleophilic than NH_3 but a weaker base.
- d) One of the products of Reimer-Tieman reaction of p-Cresol is 'A' but not 'B'—explain.

[Turn over]



(A)

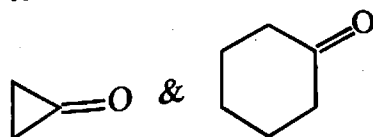


(B)

- e) Explain 'umpolung' with suitable example.
- f) Compare the stabilities of the following molecules with proper reason.
I-Butene, Cis-2-Butene and trans-2-Butene
- g) How will you convert benzil to diphenylacetylene via hydrazone formation?
- h) Explain why C=C bond of an alkane is not reduced by LiAlH_4 .

2. Answer any two questions: 5×2=10

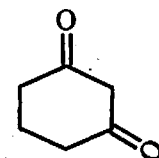
- a) i) Compare the reactivity of the following pair towards HCN. 2



- ii) What happens when Iso-propyl magnesium bromide is added to Di-isopropyl ketone? Explain your answer with mechanism. 3

- b) i) Explain why $\text{Me}_2\text{C}=\text{CH}_2$ reacts readily with conc HCl but $\text{CH}_2=\text{CH}_2$ requires AlCl_3 as catalyst.

- ii) Identify the product from the following reaction:

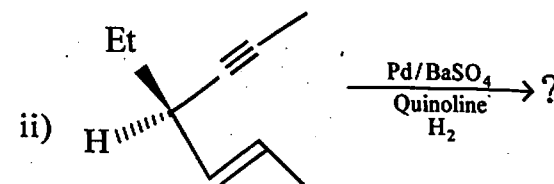
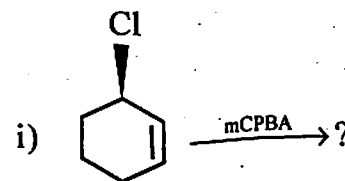


3+2=5

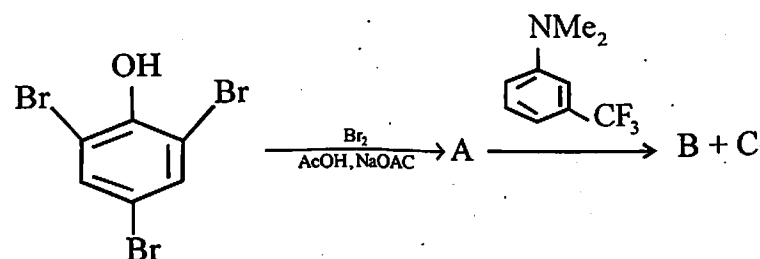
- c) i) State $\text{S}_{\text{N}}\text{i}$ reaction with suitable example. What is $\text{S}_{\text{N}}\text{i}'$ reaction?
- ii) Define hard and soft nucleophiles.

3+2=5

- d) I) Predict the product(s) with proper stereochemistry.



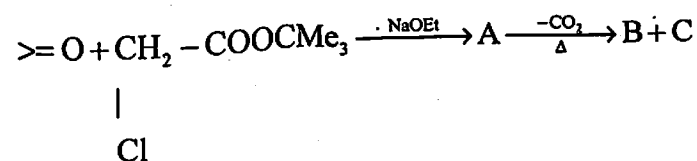
- II) Indicate the structure of A, B and C in the following reaction sequences:



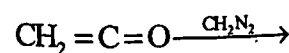
$$(1\frac{1}{2} + 1\frac{1}{2}) + 2 = 5$$

3. Answer any two from the following: $10 \times 2 = 20$

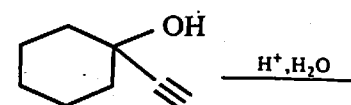
- a) i) What is benzyne? Why it is so reactive?
 ii) Predict the structure of 'A', 'B' and 'C' in the following reaction sequences. Explain their formation with mechanism.



- iii) DBU/MeI can be used for methylation of RCOOH in stead of CH_2N_2 . Justify.
 iv) What is Girard reagent-T? Give its one use.
 b) i) Complete the following reaction and suggest mechanism

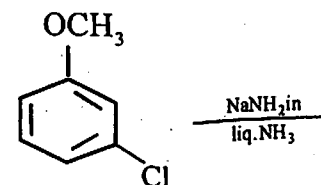


- ii) Write one evidence for the formation of σ & π complex in electrophilic substitution reaction.
 iii) What is Gilman Reagent? Give one use of it.
 iv) Identify product and write mechanism of the following reaction:



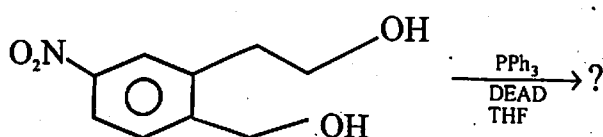
$$3 + 3 + 2 + 2 = 10$$

- c) i) What is cine substitution reaction? Complete the following reaction and suggest mechanism

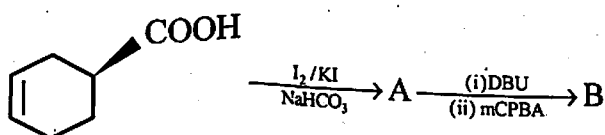


- ii) Identify the product when Iso-propyl magnesium bromide is allowed to react with Di-isopropyle Ketone. Give mechanism to establish your answer.
 iii) Give an example of Blaise reaction. Write one use of both NBS & PCC.

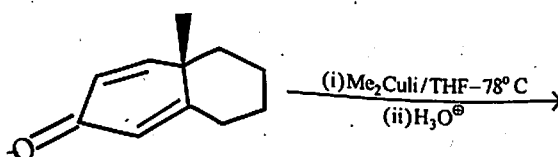
- iv) Compare electron density at p-position of pMe & PhCMe_3 . $3+3+3+1=10$
- d) i) How will you convert erythro-1, 2-diphenyl-1,2-ethenediol to z-stilbene?
- ii) Sulphonation of benzene shows primary kinetic isotope effect —explain.
- iii) Predict the product with mechanism :



- iv) Write down the structure of B with proper stereochemistry:



- v) Give the stereostructure of the product with proper reason:



$$2+2+2+2+2=10$$