



Register Number:

DATE:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU – 27

B.Sc. – IV SEMESTER

END SEMESTER EXAMINATION, APRIL 2020

CH 418 : CHEMISTRY

Time: 1½ hours

Max. Marks: 35

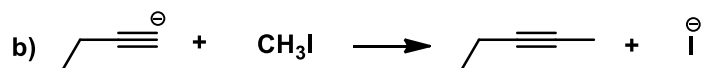
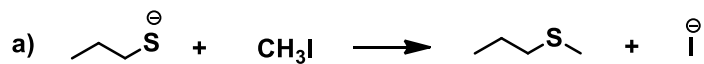
*Note: This question paper has **three** pages and **three** sections*

PART A

Answer any THREE of the following:

3 X 2 = 6

1. State saytzeff's rule.
2. Write the Williamson's ether synthesis of diethyl ether.
3. Write a chemical reaction following Markonikov's rule.
4. In spite of being a primary alkyl halide, neopentyl iodide undergoes S_N1 reaction. Why?
5. Identify the nucleophile and the leaving group in the following reactions:

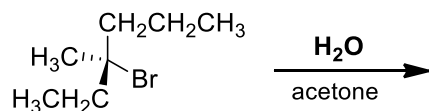


PART B

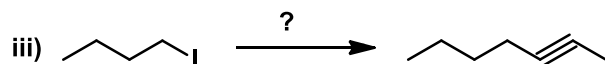
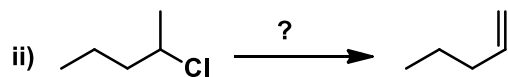
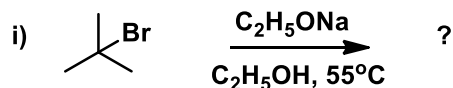
Answer any FOUR of the following:

4 X 6 = 24

6. a) Write the possible product(s) and reaction mechanism for the following reaction:
(Hint: Acetone is used as a co-solvent to dissolve the alkyl halide)



b) Complete the following reactions:



(3+3)

7. Arrange the following alkyl halides: $(\text{CH}_3)_3\text{CBr}$, CH_3Br , $\text{CH}_3\text{CH}_2\text{Br}$, $(\text{CH}_3)_2\text{CHBr}$ with respect to their reactivity towards $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$ reactions. Give reasons for their order of reactivity. (6)
8. a) Discuss the relative stability of the following alkenes based on their heats of hydrogenation: 1-butene, *cis*-2-butene, *trans*-2-butene. (Numerical values of heats of hydrogenation not required).
b) What is Diels Alder reaction? Give an example. (3+3)
9. a) Write appropriate chemical reactions to show the synthesis of an alkene from:
i) geminal dihalide; ii) vicinal dihalide.
b) Explain the regioselectivity of the reaction of HBr to 1-propene in the presence of a peroxide. (3+3)
10. a) Propose a suitable reaction mechanism for the reaction of 2-butene with bromine. Comment on the stereochemistry of the product.
b) Explain the effect of solvent on substitution reactions of alkyl halides. (3+3)
11. a) Write the structures of major and minor products formed when HBr is added to 1,3-butadiene at i) -80°C , ii) 40°C . Identify the kinetic and thermodynamic products. (Free energy diagram not required).
b) Explain the regioselectivity of base catalyzed ring opening of an unsymmetrical epoxide with an example. (3+3)

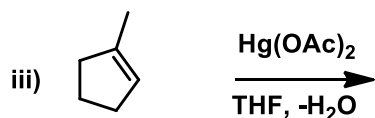
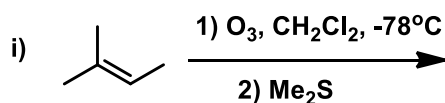
PART C

Answer any ONE of the following:

1 X 5 = 5

12. a) A compound **X** decolourised a solution of potassium permanganate and produced a brown precipitate. Upon treatment with 1 mole of H_2/Pt , **X** gave *n*-propane. Identify **X** and write the chemical reactions involved.

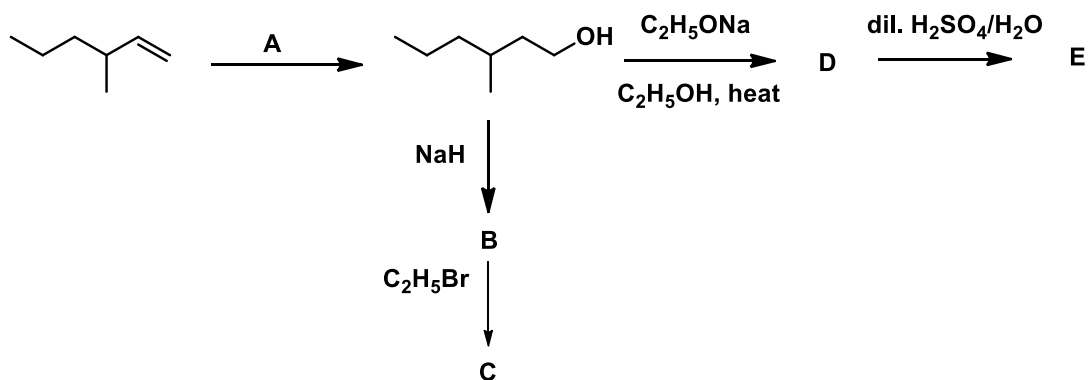
b) Write the products of the following reactions:



(2+3)

13. Predict **A** to **E** in the following sequence of reactions:

(5)



-----End of questions-----