



FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION-2017 FOR RECRUITMENT TO
POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT

Roll Number

CHEMISTRY PAPER-II

TIME ALLOWED: THREE HOURS

PART-I(MCQS): MAXIMUM 30 MINUTES

PART-I (MCQS)

PART-II

MAXIMUM MARKS = 20

MAXIMUM MARKS = 80

NOTE: (i) Part-II is to be attempted on the separate Answer Book.

(ii) Attempt ONLY FOUR questions from PART-II. ALL questions carry EQUAL marks.

(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.

(iv) Candidate must write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.

(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.

(vi) Extra attempt of any question or any part of the attempted question will not be considered.

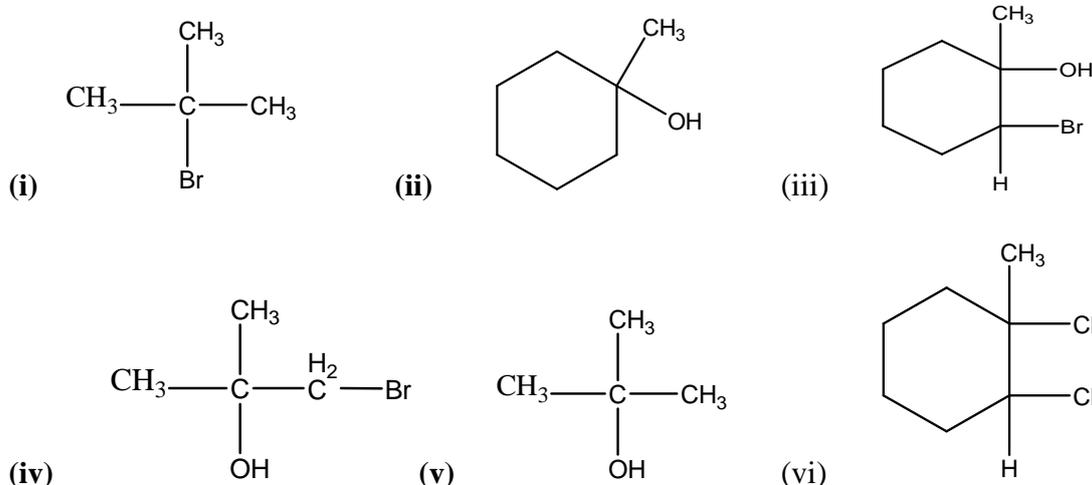
(vii) Use of Calculator is allowed.

PART-II

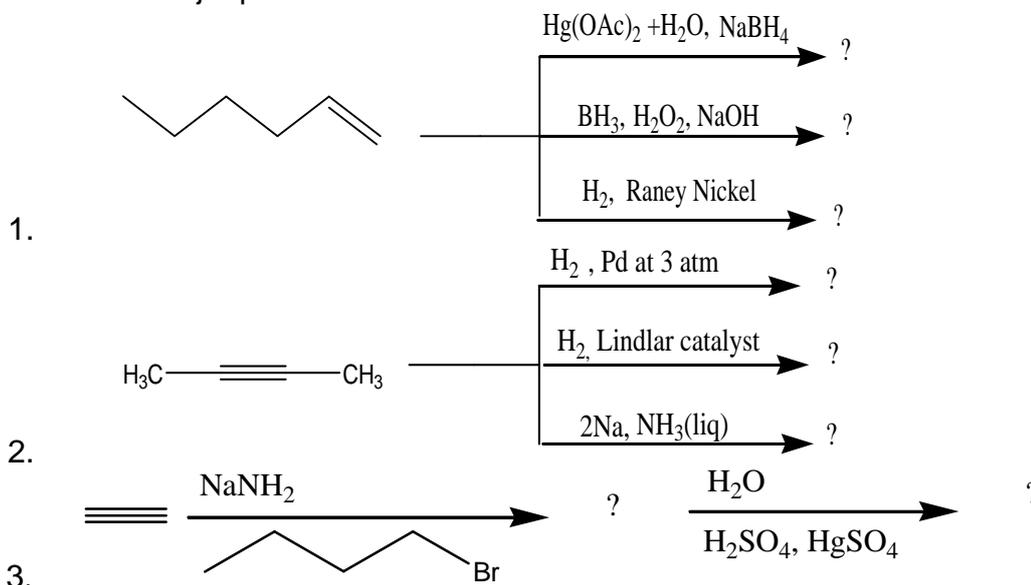
Q. No. 2. Write brief notes on the following (2 each) (20)

- (i) Covalent Bond (ii) Hybridization (iii) Isomerism
(iv) Monosaccharides (v) Triglycerides (vi) Electronegativity
(vii) The Inductive Effect (viii) Chemical Shift (ix) Stereoselectivity
(x) Fertilizers

Q. No. 3. (a) Give the method of synthesis of the following compounds from an appropriate alkene of your choice with reagents. (12)

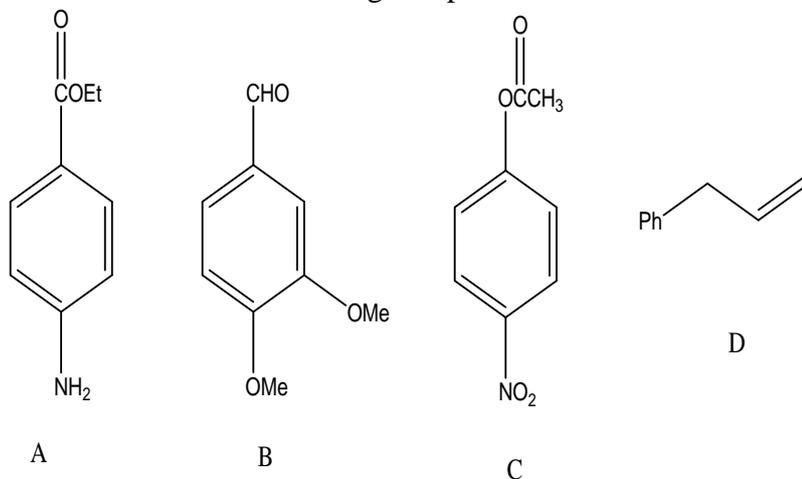


(b) Write the Major product for these Reactions. (8)



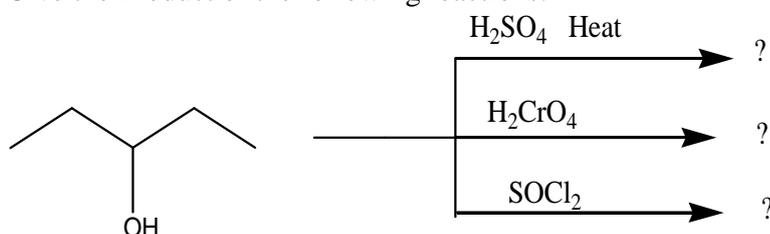
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- Q. No. 4.** (a) What is aromaticity? Explain the Hückel criteria for aromaticity. (6)
 (b) Write names of the following compounds. (4)

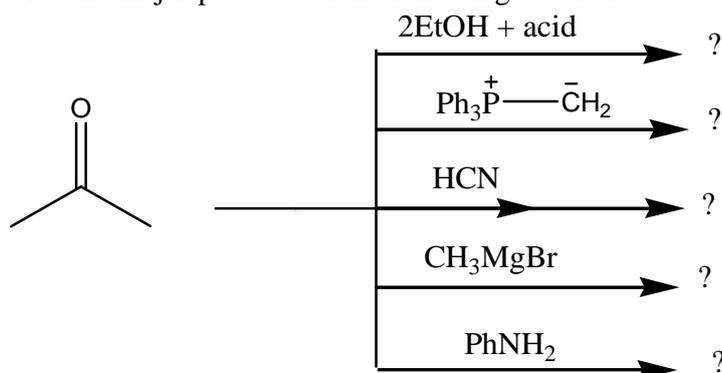


- (c) Write the reaction and mechanism of Friedel Craft alkylation and acylation reaction. (10)

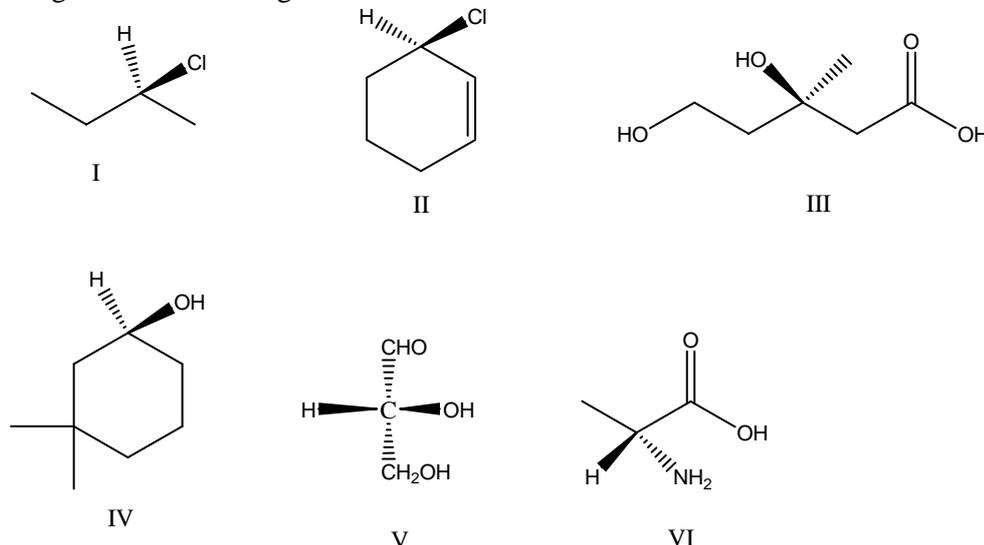
- Q. No. 5.** (a) What is Grignard reagent? What are its applications? How would you prepare Grignard reagent starting from an alkyl halide of your choice. (8)
 (b) Give the Product of the following reactions: (3)



- (c) Give the IUPAC nomenclature of Aldehydes and Ketones. (4)
 (d) Give the major products of the following reactions. (5)

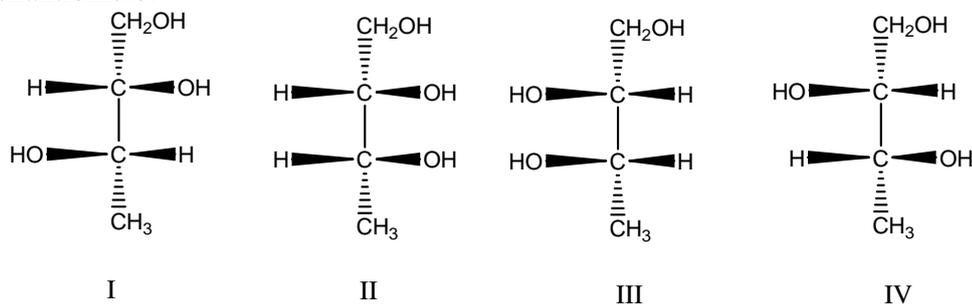


- Q. No. 6.** (a) What is stereoisomerism? Give an account of different types of stereoisomerism. (5)
 (b) Assign an R or S configuration to the chiral center in each molecule. (9)

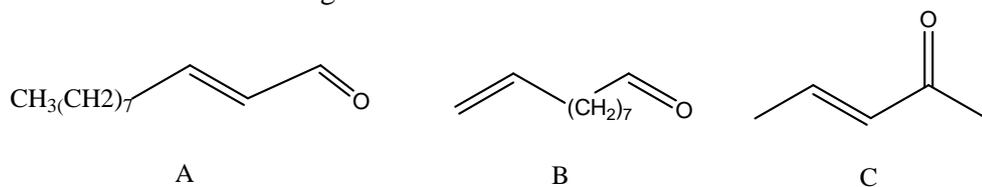


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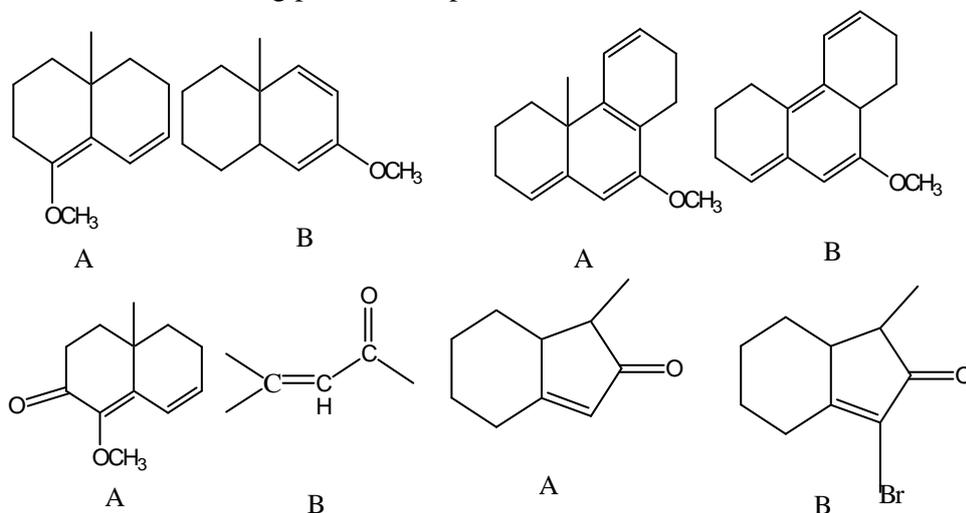
- (c) In the following molecules identify that which are diastereomers and which are enantiomers? (6)



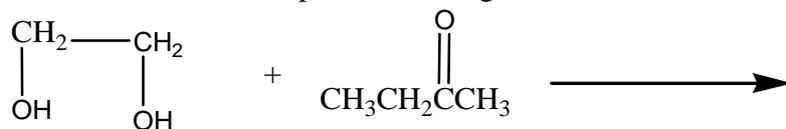
- Q. No. 7.** (a) What is the difference between Dispersive IR Spectrometer and Fourier Transform (FT)-IR Spectrometer. (5)
 (b) Differentiate the following on the basis of IR. (3)



- (c) Differentiate the following pairs of compounds on the basis of UV. (8)



- (d) Deduce the structure of the product of the given reaction from the following data. (4)



The product has

IR: Four strong bands that appear in the range of 1200 to 1020 cm^{-1}

NMR: 3 Proton triplet at 0.8ppm, 3 Proton singlet at 1.3ppm, 2 proton quartet at 1.8ppm and 4 proton multiplet at 4.0ppm

- Q. No. 8.** Write notes on any **FOUR** of the following: (5 each) (20)
- Reactions of Monosaccharides
 - Biosynthesis of Cholesterol
 - Primary structure of Polypeptides and Protein.
 - Prostaglandins
 - Synthesis of Peptides
