

PG-242

10307

IV Semester M.Sc. (CBCS) Examination, July - 2019

CHEMISTRY

C-401-OC : Organometallic and Heterocyclic Chemistry

Time : 3 Hours

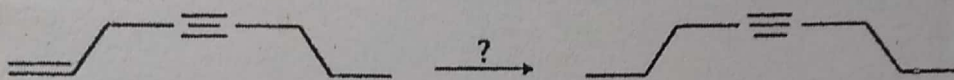
Max. Marks : 70

Instruction : Answer question no. 1 and any five of the remaining.

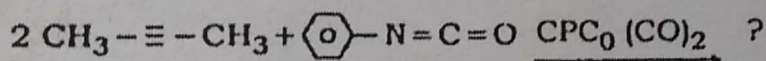
1. Answer any ten of the following :

10x2=20

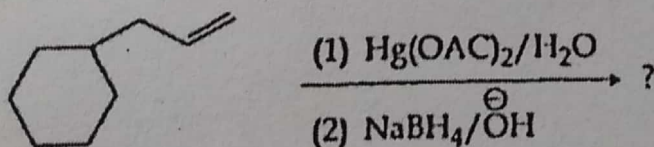
- (a) Describe Heck reaction by taking a suitable example.
 (b) How is the following conversion achieved ?



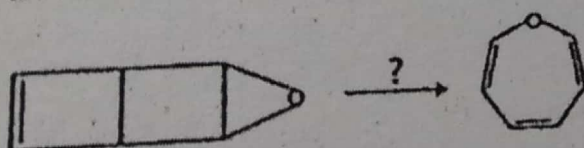
- (c) State Green rules.
 (d) Mention a method for the preparation of organozinc compound.
 (e) Identify the product in the following reaction :



- (f) With suitable example, suggest any one method of preparation of organo selenium and organotellurium compounds.
 (g) Sketch the product and formulate a suitable mechanism for the following reaction :

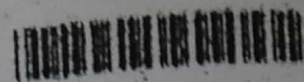


- (h) Write any two reactions of benzofuran.
 (i) Outline any two methods for the synthesis of 1, 3, 5 - triazines taking suitable examples.
 (j) Give the classification of mesoionic compounds and give one example each.
 (k) Suggest the reagent and propose mechanism for the following transformation :

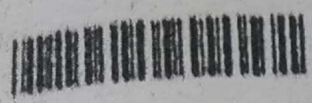


- (l) Suggest the synthesis of 1-OXO-1-phenyl phosphorinane.

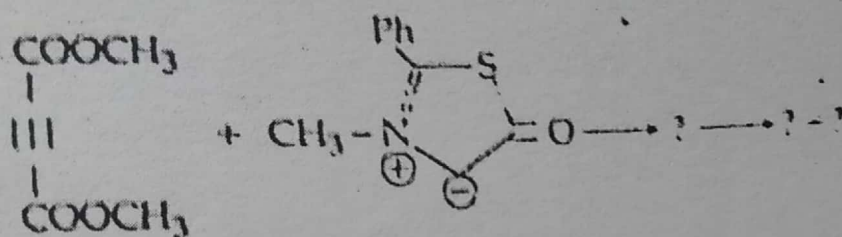
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2. (a) Compute the EAN value for the following :
 (i) NiCOI_2 (ii) CP_2Fe
 (b) Formulate Felkin reaction with suitable mechanism.
 (c) Discuss the use of organotransition metal complexes in the protection of olefins with suitable examples.
3. (a) Suggest the mechanism for conversion of ethylene to acetaldehyde.
 (b) Write any one method of complexation and decomplexation of η^3 -allyl and η^4 -diene complexes. 4+3+3=10
 (c) Illustrate the isomerisation of alkenes by transition metal catalyats with Plausible mechanism.
4. (a) Describe carbonylation reactions with Zirconium compounds. 3+4+3=10
 (b) Illustrate with examples, the use of iron complexes in the insertion of carbonyl group in dienes, vinyl epoxides and alkyl halides.
 (c) Write a note on Gilman reagent.
5. (a) Give a brief account on hydroalumination and carboalumination reaction.
 (b) Propose a suitable mechanism for the following transformation. 4+3+3=10
- $$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}^1 \xrightarrow{\text{SeO}_2} \text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}=\text{CH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}^1$$
- (c) Illustrate Peterson reaction with suitable example.
- (a) Outline solvomercuration and demercuration reactions with suitable examples. 4+3+3=10
 (b) Describe Barton deoxygenation reaction.
 (c) Propose various reactions given by aziridine and azetidene.
- (a) Mention any two synthesis of Diazocines.
 (b) Sketch any two synthesis of 1, 2 - diazines. 4+3+3=10
 (c) Outline a method for the synthesis of munchnone (meso ionic - oxazole)



8. (a) Identify the products in the following reaction :



- (b) Illustrate with examples, synthesis of six membered ring systems containing arsenic and antimony as hetero atoms.
- (c) Write a note on Phosphole.

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