BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

Mid-Semester Examination Second semester 2022-2023

Course No: CHEM F415 Course Title: Frontiers in Organic Synthesis (**closed Book**)
Time: 90 min. Max. Marks: 60 Date: 16 March 2023

Q 1Using Heck/Tsuji-Trost coupling reaction or any other suitable reaction, prepare the target compounds given below and mechanistically explain the involved synthetic steps

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$$(i) \qquad \begin{array}{c} Br \\ OH \end{array}$$

(ii) ?
$$O_2Me$$
 (iii) O_2Me

- Q 2. (a) Comment on the stability of the following complexes
 - (i) $bis(\eta^6-benzene)chromium(0)$
- (ii) bis(η⁵–cyclopentadienyl)cobalt(II)

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(b) Write the required reagents/conditions to prepare the stereoisomers P and R from ketone A.

Explain the different streochemical outcome in the formation of **P** and **R**

- (c) Write the structures for each of the following
 - (i) JohnPhos
- (ii) SPhos
- (d) Using suitable ammonia surrogate and aryl chloride prepare *p-t*-butylaniline
- (e) What is the oxidation state of palladium in following pre-catalyst. Write the steps and reaction conditions required to generate active palladium. How the pre-catalyst is superior to valuable precursor, Pd₂(dba)₃.4