D 6820 (Pages : 2) Name.....

Reg. **No.....**

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2016

(CUCSS)

Chemistry

CH 3E 01—SYNTHETIC ORGANIC CHEMISTRY

(2015 Admissions)

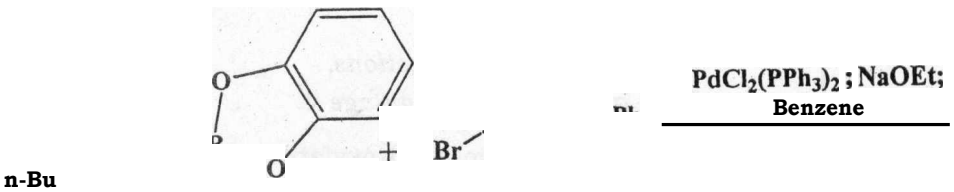
Time : Three Hours Maximum : 36 **Weightage**

Section A

Answer **all** *questions.*

Each question carries 1 weightage.

1. Which product would be obtained by the reaction of $Me_2C(OH)\text{-}CH{=}CH_2$ with oxygen in the presence of $PdCl_2$ and CuCl ? Explain the steps involved.
2. Illustrate the use of (i) IBX ; and (ii) PCC in organic synthesis.
3. Which product would arise from the Birch reduction of (i) ethyl benzoate ; and (ii) *o*-xylene ?
4. The biphasic reaction of *n*-octyl iodide with NaCN in water-organic solvent mixture is promoted by tri-*n*-butylammonium iodide much better than by ammonium iodide. What is the reason ?
5. What product would form in the Ni acetylacetonate catalysed reaction of PhMgBr with Ph-CH=CHBr ?
6. What product would result by the reaction of methyl vinyl ketone, $H_2C{=}CH\text{-}CO\text{-}CH_3$ with the eneamine obtained by the Stork reaction between cyclohexanone and pyrrolidine, followed by acid hydrolysis ?
7. What product wound form in the following Pd catalysed coupling ? What is the name of the reaction?



8. Suggest the reagents and reactants required to prepare *trans* -Ph-CH=CH-COOEt by Heck reaction
9. Write an example each of chemo and regioselectivity in synthesis.

Turn over

10. What is meant by functional group interconversions ? Cite an example.
11. Which heterocycle would form by the reaction of thioacetamide with $Br\text{-}CH_2\text{-}CH(OMe)_2$?
12. Illustrate how 1,2,4-triazole system can be prepared.

(12 x 1 = 12 weightage)

Section B

Answer any **eight** *questions.*
Each question has weightage 2.

13. What is TEMPO ? Explain its role as a catalyst in environment friendly oxidantions using oxygen or sodium hypochlorite. Cite typical examples of its use.
14. Illustrate, with typical examples, the use of Gilman reagent C-C bond forming reactions.
15. Explain the use of radical reactions of trialkyltin hydrides as a synthetic tool.
16. Describe the formation, reactions and uses of aryl tricarbonyl chromium reagents.
17. Suggest a reaction for the preparation of 2-ethoxycarbonyl cyclohexan-1-one [where ethoxycarbonyl is EtO-CO-] from an acyclic precursor and exploiting carbonyl reactivity.
18. What is the concept of "split-and-pool" that form the basis of combinatorial synthesis ?
19. Write an account of the use of organotin reactants in coupling reactions. Which other substrate, catalyst and conditions are required ?
20. Describe the method of C-C bond formation by Sonogashira reaction.
21. Explain with examples Hiyama and Negishi couplin reactions.
22. What are the reasons for the requirement of functional **group** protection-deprotection in synthesis ? Explain using amino group as a typical example.
23. What is meant by polarity reversal of reactivity ? With an example, illustrate how this can be used in synthesis.
24. Explain the chemical synthesi of vitamin C.

(8 x 2 = 16 weightage)

Section C

Answer any **two** *questions.*
Each question has weightage **4.**

25. Write an account of : (i) Woodward ; and (ii) Prevost hydroxylation, with attention to stereochemical outcome.
26. Explain the reactions of sulfur and phospherous ylids that are useful in C-C bond making reactions.
27. Mention the key chemical steps in the preparation of Djerassi-Prelog lactone.
28. Write a retrosynthetic analysis scheme each for (i) benzocaine ; and (ii) propranolol.

(2 x 4 = 8 weightage)