



Register No:

Date:

St. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE – 27

**M.Sc. ORGANIC CHEMISTRY-III SEMESTER**

SEMESTER EXAMINATION: OCTOBER- 2021

**(Examination conducted in January-March 2022)**

**OCH 9219: ORGANIC SYNTHESIS- II**

(Retrosynthesis and modern aspects of organic chemistry)

**Time: 2 ½ hrs**

**Max. Marks: 70**

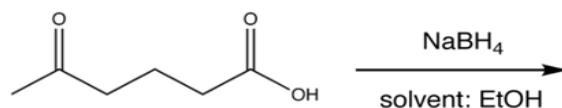
**The question paper contains four printed pages and three parts**

**PART-A**

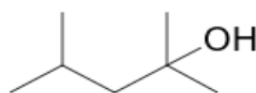
Answer any **SIX** questions

**2x6=12**

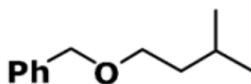
1. Suggest any two equivalents for R-CO-CH<sub>2</sub>.
2. Explain chemoselectivity in the following reaction and complete the reaction.



3. How do you convert toluene to p-amino benzoic acid?
4. How can you convert 1,2-ethanediol to a five membered heterocyclic compound?
5. Where would you prefer to disconnect the following molecule and why?



6. What are the synthons obtained on C-X disconnection of the following compound?



7. What do you understand by 'Umpolung'? Label the umpolung synthon in the disconnection of 2,5-hexanedione.
8. How can you convert butane-1,4-dioic acid (succinic acid) into its monoester?

## PART-B

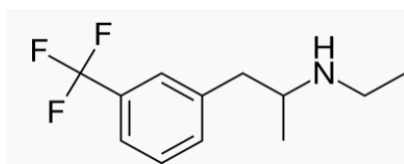
Answer any **FOUR** of the following

**4x12=48**

9. (a) Demonstrate the synthesis of the following epoxide by disconnection. How would you ensure the stereochemistry of epoxide?

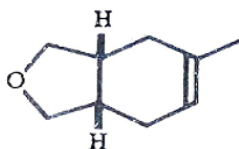


- (b) Amines often pose the problem of chemoselectivity. Show by disconnection, how you would solve this problem in the case of synthesis of the following amine which is a neurotransmitter?

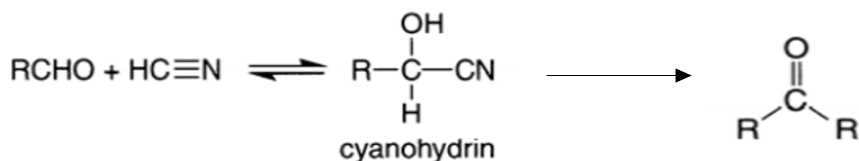


**(6+6)**

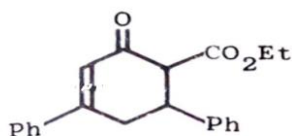
10. (a) Use Diels-Alder disconnection approach and synthesise the following TM.



- (b) How can you bring about the following conversion by Stetter reaction?

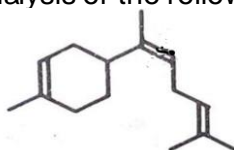


- (c) Demonstrate 1,5-DiCO in the synthesis of the following compound.

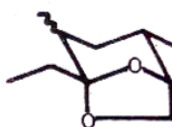


**(4+4+4)**

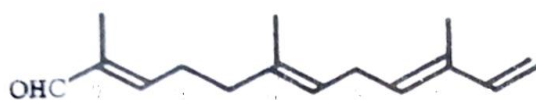
11. (a) Carry out convergent analysis of the following sesquiterpene, bisabolene



- (b) Give the linear synthesis of the pheromone multistriatin (structure given below)



(c) Give the linear synthesis of  $\alpha$ -sinensal (structure given below).



(4+4+4)

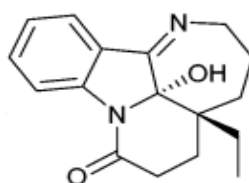
12. (a) Illustrate carbene reactivity of keteniminium ion (formed from  $\alpha$ -chloro enamines) in the formation of an aminocyclopropane derivative.  
(b) How do you use ethyldiazoacetate (EDA) as 'one carbon synthon' in Wang's indole synthesis?  
(c) Give full forms of TMSO and  $\text{Tf}_2\text{O}$ . Give an application each.  
(d) Give any three methods of generation of benzyne.

(3+3+3+3)

13. (a) Give the reaction of annulation of aryne with enamides giving papaverine alkaloid.  
(b) What do  $\text{LiTMP}$  and  $\text{Mg}(\text{TMP})_2$  stand for? Give their applications.  
(c) Give the structures of *o*-QDM, aza-*o*-QM and *o*-QM. Classify them as normal electron demand and inverse electron demand dienes.  
(d) How can you do photo induced intermolecular Diels-Alder reaction for the construction of benzobicyclo[2,2,2] octane skeleton?

(3+3+3+3)

14. (a) Give Corey synthesis of virantamycin using Diels-Alder strategy.  
(b) Show oxidative coupling of indole and carvone.  
(c) How can mersicarpine (structure shown below) be prepared by  $\text{Mn}(\text{OAc})_3$  catalysed Michael reaction of  $\alpha,\beta$ -unsaturated amides with acetylacetone?



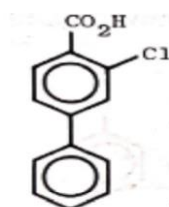
(4+4+4)

### PART-C

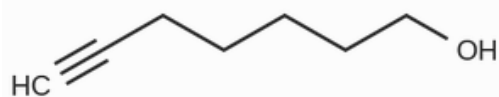
Answer any **TWO** of the following

**2x5=10**

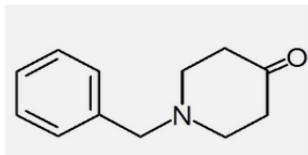
15. Write the synthesis of the following compound from diphenyl.



16. How would you methylate the following at the acetylenic carbon?



17. Suggest a synthesis of the following saturated heterocyclic compound based on the analysis.



.....end of questions.....