P.G. 3rd Semester - 2017

CHEMISTRY

(MAJOR ELECTIVE)

(ORGANIC)

Paper: MCHEMET303

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any **five** questions taking at least **two** from each group.

GROUP-A

1. a) Suggest the Retrosynthetic analysis of the following TM and then propose a synthetic route starting from the easily available wittig Reagent

b) Propose good disconnection for the following TM(S).

[Turn Over]

OH Me Me Me OH
$$C \equiv CN$$
 , $(TM-II)$

c) Propose the retrosynthetic analysis of the following TM.

$$H$$
 $H_{17}C_{8}$
 $C_{13}H_{27}$
 $3+3+2=8$
(TM)

2. a) Propose the retrosynthetic analysis of the TM without use of the wittig reagent in the formation of C=C bond

- b) Define synthon and synthetic equivalent.
- c) Suggest the retrosynthetic analysis of the following TM based on Ring Closing Metathesis. Give the forward synthesis.

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- 3. a) Give the appropriate product in the following reactions:
 - $i) \qquad \text{CH}_{3}O \underbrace{ \left(\text{HO} \right)_{2}^{B} \left(\text{HO} \right)_{2}^{B} \frac{\text{PU}(OAC)_{1}, 2 \text{mol}^{B}_{3}}{25 \text{equiv K}_{1}\text{CO}_{1}}}_{\text{25 equiv K}_{1}\text{CO}_{1}}?$

- iii) $CH_3(CH_2)_4 CH = CHI + HC \equiv C(CH_2)_3 OH \xrightarrow{Pd(PPh_3)_4, 5mol\%} ?$
- b) Write four basic differences between the Suzuki and Stille coupling reaction.

$$1\frac{1}{2}+1\frac{1}{2}+2+3=8$$

4. a) Give appropriate product in the following reactions: $4\times2=8$

ii)
$$(CH_2)_2 \times \frac{Glubbs}{Catalyst}$$

iii)
$$CH = CH_2 \xrightarrow{Pd(CH_3CN)_2, Cl_2, 2mol\%} CH = CH_2 \xrightarrow{NBO_2CCH_1, Ph_3 \stackrel{0}{N}Cl \hookrightarrow NMP} CH$$

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[Turn Over]

GROUP-B

5. Give the appropriate product in the following reactions:

a)
$$PhCH_2O$$
 OH $Me_2Cu(CN)Li_2 \rightarrow ?$

b)
$$CH_3$$

$$OCOCH_3 \xrightarrow{Me_2CuL_2} ?$$

$$C) \qquad C \equiv C - CH - C_5H_{11} \xrightarrow{CH_3Cu - LiBr - MgBrI} ?$$

d)
$$C_4H_9COOCH_3 + (CH_3)_2CHCHBr_2 \xrightarrow{Zn,TiCl_4} ?$$

e)
$$(CH_3)_2 CHCH = 0 + Me$$

$$Cl \xrightarrow{Zn-dust, H_2O} ?$$

$$Me$$

$$1+1+1,\frac{1}{2}+1,\frac{1}{2}+1,\frac{1}{2}+1,\frac{1}{2}=8$$

6. a) Same products are obtained from 2-acetoxy-4-phenyl-3-butene and 1-acetoxy-1-phenyl-2-butene. Account for the abbervation with mechanism.

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b) Give product with mechanism:

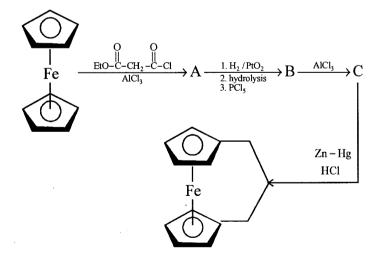
i)
$$Pd(OAC)_2 \longrightarrow COOH$$

$$O_2, DMSO \longrightarrow COOH$$

ii)
$$H_9C_4$$
 I + $CH_2 = CHCOOMe - \frac{10.02 \text{mol }\%}{Pd(OAC)_2}$ $\frac{Pd(OAC)_2}{20 \text{ eqv. Bu}_4NCl}$ $\frac{10.02 \text{mol }\%}{2.5 \text{ eqv. }K_2CO_3}$ $\frac{10.02 \text{mol }\%}{DMF. 25^{\circ} \text{ C}}$

$$3+2\frac{1}{2}+2\frac{1}{2}=8$$

- 7. a) Discuss the fluxional behavior and ring whizzing of $(\eta' C_p)(\eta^5 C_p)$ Fe(CO)₂.
 - b) Write the structure of intermediate compound A and B in the following reaction scheme:



c) Synthesis (s)-Fluoxetine starting from

d) Identify (P) of the following reaction

$$\begin{array}{c|c}
OMe & O \\
\hline
OMe & \\
OMe & \\
\hline
BH_3.THF
\end{array}$$

2+3+2+1=8

- 8. a) Define chiral pool and chiral auxiliary. Give example in each case with exact structure.
 - b) Synthesis imipenem starting from L-aspartic acid.
 - c) Synthesis (-)-frontalin.

3+3+2=8
