

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
August/September -2020 [NEW COURSE]
Organic Chemistry (CORE)

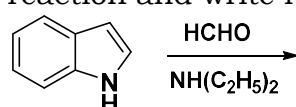
Time: 2:00 Hours

Marks: 56

Instructions:

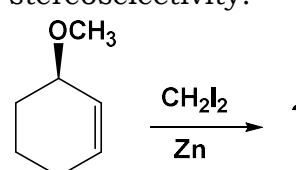
1. Figure to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any four of the following questions.
-

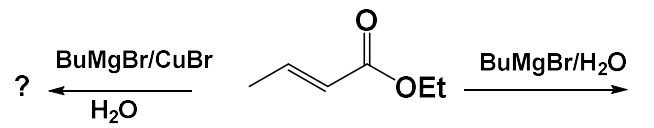
UNIT-1 (14 marks)Answer ALL questions

- Q.1 (a) Answer the following** **Marks**
- (1) What are multicomponent reactions (MCR)? Identify the following reaction and write its product. 2
- 

The reaction shows indole (a benzene ring fused to a pyrrole ring) reacting with HCHO and $\text{NH}(\text{C}_2\text{H}_5)_2$ to form a product.
- (2) When benzoic acid, benzaldehyde and t-butyl isocyanide reacted in aprotic solvent it produced α -acycloxyamide derivatives. Identify this reaction and write its mechanism. 2
- Q.1 (b) Answer any two question out of three.** **Marks**
- Describe principle, mechanism and three applications of the following MCR:
- (1) Ugi reaction 5
 - (2) Hantzsch reaction 5
 - (3) Mannich reaction 5

UNIT-2 (14 marks)Answer ALL questions

- Q.2 (a) Answer the following** **Marks**
- (1) Predict appropriate products for following reaction and explain its stereoselectivity. 2
- 

The reaction shows methyl cyclohex-2-en-1-yl ether (a cyclohexane ring with a double bond and a methoxy group at the 1-position) reacting with CH_2I_2 and Zn to form a product.
- (2) Write appropriate products for following reaction sequences and justify your answer. 2
- 

The reaction sequences start from ethyl 3-methyl-2-pentenoate (a five-carbon chain with a double bond between C2 and C3, a methyl group at C3, and an ethyl ester group at C1). The first sequence is: $\text{?} \xrightarrow[\text{H}_2\text{O}]{\text{BuMgBr/CuBr}}$. The second sequence is: $\text{?} \xrightarrow{\text{BuMgBr/H}_2\text{O}}$.
- Q.2 (b) Answer any two question out of three.** **Marks**
- Describe principle, mechanism and three application of following olefination reaction:
- (1) Wittig reaction 5
 - (2) Horner-Wadsworth-Emmons (HWE) reaction 5
 - (3) Baylis-Hillmann reaction 5

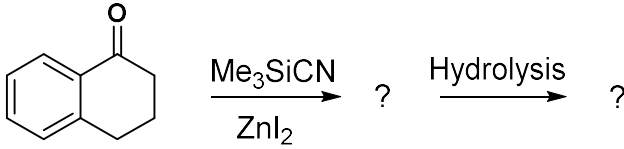
UNIT-3 (14 marks)
Answer **ALL** questions

- Q.3 (a) Answer the following** **Marks**
- (1) Write any four structure of Pd⁽⁰⁾ complexes which are utilized in the C-C cross coupling reaction. How will you prepare tetrakis-triphenylphosphine ? 2
- (2) Write catalytical cycle for Stille cross coupling reaction. 2
- Q.3 (b) Answer any two question out of three.** **Marks**
- Describe principle, substrate variation and catalytical cycle for the following Pd-catalyzed reactions:
- (1) Suzuki 5
- (2) Heck 5
- (3) Sonogashira 5

UNIT-4 (14 marks)
Answer **ALL** questions

- Q.4 (a) Answer the following** **Marks**
- (1) Answer the following:
- (a) Which wave length of light will produce $n\pi^*$ and $\pi\pi^*$ transition? How will you obtain that specific light? 2
- (b) Define (i) Quantum yield (ii) Stark-Einstein law
- (2) Give one example of following photo-induced cleavages:
- (a) Norrish type-I 2
- (b) Norrish type-II
- Q.4 (b) Answer any two question out of three.** **Marks**
- (1) Write a note on Di- π methane rearrangement. 5
- (2) Explain Jablonski diagram in detail. 5
- (3) Describe principle and mechanism of Paterno-Buchi reaction with suitable example. 5

UNIT-5 (14 marks)
Answer **ALL** questions

- Q.5 (a) Answer the following** **4 Marks**
- (1) Complete the following reaction sequence.
- 

O=C1CCCCC1Cc2ccccc2 $\xrightarrow[\text{ZnI}_2]{\text{Me}_3\text{SiCN}}$? $\xrightarrow{\text{Hydrolysis}}$?
- (2) Explain regioselectivity of NBS reagent with suitable example. 2
- Q.5 (b) Answer any two question out of three.** **10 Marks**
- Give chemical structure and describe at least four applications of following reagent:
- (1) DCC 5
- (2) Phase transfer catalyst TBAB 5
- (3) TEMPO 5
