

**M.Sc.(Chem.) Semester - 2 (CBCS) Examination**  
**March/April – 2025 (As Per Syllabus Year-2018)**  
**Organic Chemistry (CORE)**

Time: 2:30 Hours

Marks: 70

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

**Que-1(A) Answer the following.****(04)**

- (1) What are multicomponent reactions (MCR)? Identify the following reaction and write its plausible mechanism:

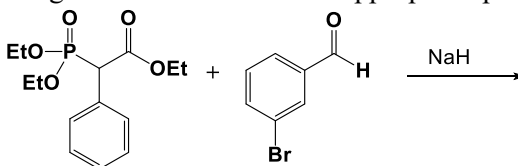
**Que-1(B) Answer any two questions out of three.****(10)**

Describe principle, mechanism and three applications of the following MCR:

- (1) Passerini reaction
- (2) Hantzsch reaction
- (3) Mannich reaction

**Que-2(A) Answer the following****(04)**

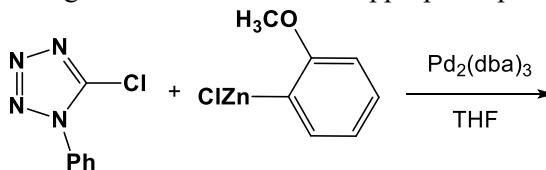
- (1) What is organocatalyst? Give three examples.
- (2) Identify the following reactions and write its appropriate product:

**Que-2(B) Answer any two questions out of three.****(10)**

- (1) Write a note on peterson olefination.
- (2) Describe various factors affecting conjugate and direct addition reaction with example.
- (3) Describe Horner-wadsworth-emmons (HWE) reaction in detail.

**Que-3(A) Answer the following****(04)**

- (1) Write any four structure of Pd<sup>(0)</sup> complexes which are utilized in the C-C cross coupling reaction.
- (2) Identify the following reactions and write its appropriate product.

**Que-3(B) Answer any two questions out of three.****(10)**

Describe principle, mechanism and two applications of the following Pd-catalyzed reactions:

- (1) Suzuki
- (2) Heck
- (3) Sonogashira

**Que-4(A) Answer the following****(04)**

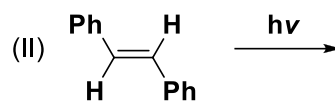
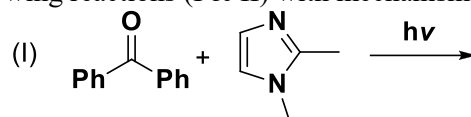
- (1) Explain:
  - (i) Grothurs-draper law
  - (ii) Stark-Einstein law
  - (iii) Quantum yield
  - (iv) Kasha's rule

**Que-4(B) Answer any two questions out of three.**

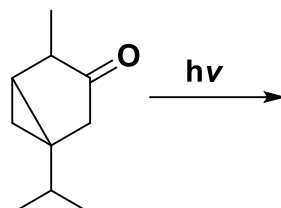
**(10)**

(1) Explain Jablonski diagram in detail.

(2) Complete the following reactions (I & II) with mechanism:



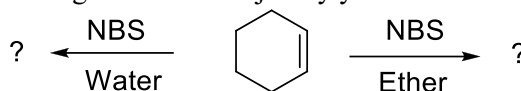
(3) Complete the following reactions with mechanism.



**Que-5(A) Answer the following**

**(04)**

(1) Complete the following reactions and justify your answer.



**Que-5(B) Answer any two questions out of three.**

**(10)**

Write chemical structure and at least four applications of following reagent:

(1) TEMPO

(2) TBAB

(3) DDQ

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