Exam Date & Time: 21-May-2022 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH END SEMESTER EXAMINATIONS, MAY 2022

CHEMISTRY OF CARBON COMPOUND [CHM 4052]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Define ring strain. Explain three different types of strain which contribute to ring strain in cycloalkanes by discussing suitable examples for each. (4)

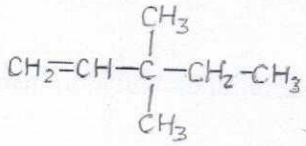
A)

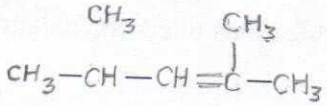
B) Define anti-Markovnikov's rule. Differentiate E1 and E2 reactions (3)

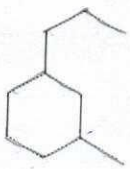
C) What is Benzoin condensation. Explain its mechanism by taking a suitable example (3)

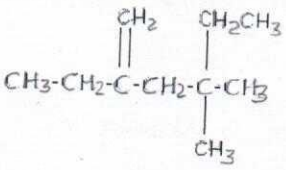
2) Name the following molecules systematically using IUPAC nomenclature

A)

a. 

b. 

c. 

d. 

(4)

B) Explain the step-wise mechanism for the nitration of nitrobenzene (3)

C) Describe the mechanism of aldol condensation reaction by taking benzophenone and acetaldehyde as starting materials (3)

3) What are organometallic compounds? Explain their general properties and write any two reactions of Grignard reagents (4)

A)

B) Justify the following

a. Benzaldehyde undergoes electrophilic substitution at meta position

b. Phenolic compounds undergo electrophilic substitution reactions at faster rate (3)

c. Pyrrole is aromatic in nature

C) Why does furan undergo electrophilic substitution at 2^{nd} position? Explain using the concept of resonance (3)

4) Explain the preparation of alkane by Wurtz and decarboxylation reactions (4)

A)

B) What do you mean by activated carbon? Explain any two methods for the activation of carbon (3)

C) Explain the classification of alcohols based on the carbinol carbon atom using suitable examples (3)

5) Describe the synthesis, any two properties and applications of carbon nanotubes (4)

A)

B) What are ketones? How do you distinguish aldehydes and ketones using an experimental method? (3)

C) What are Fullerenes? Describe any two of their applications (3)

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