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Reg.No : .....

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) Regular EXAMINATION October 2025

Third SEMESTER

Discipline Specific Core Course (DSC)

MG3DSCCHE201 - ORGANIC CHEMISTRY - I

(2024 ADMISSION ONWARDS)

Duration: 1 Hour 30 Minutes **Maximum Marks: 50**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Multiple choice questions

Answer all questions

Each question carries 1 marks

1. The general formula of alkyne is [K] / [CO1]

   a). C_nH_{2n} b). C_nH_{2n+2} c). C_nH_{2n-2} d). C_nH_{2n-1}

2. Fluorination of benzene is rarely carried out directly because: [A] / [CO2]

   a). F_2 is too weak an electrophile

   b). The reaction is too slow

   c). The reaction is uncontrollaby violent

   d). Fluorobenzene is unstable

3. Choose a type of configurational isomerism from below. [K] / [CO3]

   a). Optical Isomerism b). Conformational c). Tautomerism d). Constitutional isomerism

isomerism

4. The catalyst commonly used in hydrogenation is: [K] / [CO1]

   a). Cu b). Fe c). Pt/Pd/Ni d). Zn

5. Which description best connects benzene's resonance energy with its molecular orbital picture? [U] / [CO2]

   a). Resonance energy arises from alternating Kekulé structures

   b). Resonance energy arises from complete filling of bonding π-MOs

   c). Resonance energy arises from electron localization in double bonds

   d). Resonance energy arises from excitation into antibonding orbitals

6. According to the Sequence rule in Cahn-Ingold-Prelog (CIP) system, which among the following has the lowest priority? [An] / [CO3]

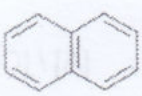
   a). $-C\equiv N$ b). $-CH_2NH_2$

   c). $-C(CH_3)_3$ d). $-CH_2CH_2CH_2CH_3$

7. Acetylenes can be regenerated from their metal acetylides on treating with [K] / [CO1]

   a). NH_3 b). H_2O c). $AgNO_3$ d). NaOCl

8. Which of the following compounds is not aromatic? [A] / [CO2]

   a).  b).  c).  d). 

9. A molecule is said to be chiral: [A] / [CO3]

   a). if it cannot be superimposed on its mirror image

   b). if it contains plane of symmetry

   c). if it contains centre of symmetry

   d). if it can be superimposed on its mirror image

10. Alkenes show: [U] / [CO1]

a). Only sigma bonds

b). Both sigma and pi bonds

c). Only pi bonds

d). Ionic bonds

[1x10 = 10]

Part B

Short Answer Questions

Answer any **4** questions

Each question carries **3** marks

11. Describe the addition of bromine to an alkyne. What products are obtained? [U] / [CO1]

12. Toluene undergoes electrophilic aromatic substitution about 4000 times faster than benzene. Explain the reason. [U] / [CO2]

13. Which is the most stable conformer of ethane? Why? [U] / [CO3]

14. Why is peroxide effect observed only with HBr? [An] / [CO1]

15. Discuss the aromatic character of the cyclopentadenyl anion. [A] / [CO2]

16. Give a brief account of any three physical properties of alkanes. [K] / [CO1]

[3x4 = 12]

Part C

Short Essay Questions

Answer any **2** questions

Each question carries **7** marks

17. Explain the free radical substitution mechanism of methane chlorination with all steps. [K] / [CO1]

18. Compare the structures and aromatic character of benzene, naphthalene, and anthracene. [An] / [CO2]

19. Draw all possible stereoisomers of tartaric acid. Identify which are enantiomers, diastereomers, and meso compounds. Explain your reasoning. [A] / [CO3]

[7x2 = 14]

Part D

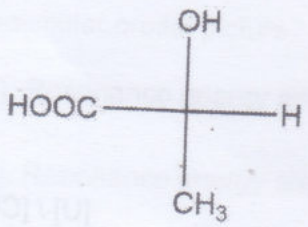
Essay Type Questions

Answer any **1** questions

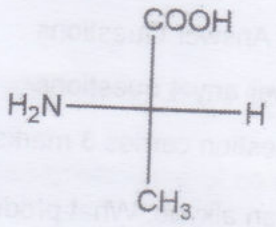
Each question carries **14** marks

20. Compare the aromaticity in heterocycles: pyridine, pyrrole, and furan. Comment on their basicity differences. [An] / [CO2]

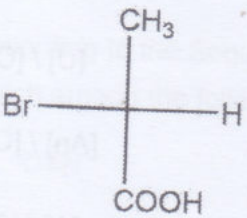
21. Assign the R and S configuration to each of the chiral centers in the following molecules. Show the reasoning used in your assignments. [A] / [CO3]



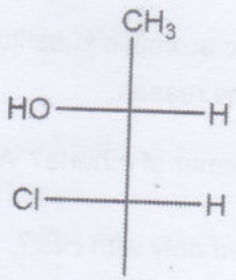
(a)



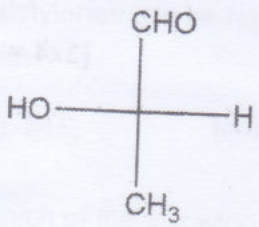
(b)



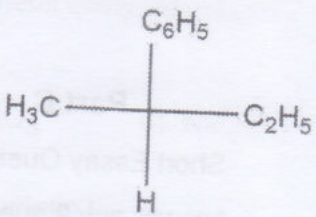
(c)



(d)



(e)



(f)

[14x1 = 14]