

2024/TDC (CBCS)/EVEN/SEM/
CHMHCC-402T/303

TDC (CBCS) Even Semester Exam., 2024

CHEMISTRY

(4th Semester)

Course No. : CHMHCC-402T.

(Organic Chemistry)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks
for the questions

UNIT—I

1. Answer any *two* questions : 2×2=4
- (a) (i) Nitroalkanes have abnormally high boiling points. Explain. 1
- (ii) Why does nitrobenzene not undergo Friedel-Crafts reaction? 1
- (b) Convert the following : 1×2=2
- (i) Acetamide to ethylamine
- (ii) Methyl isocyanide to N,N-dimethyl amine
- (c) How can you convert aniline into *p*-nitro aniline? 2

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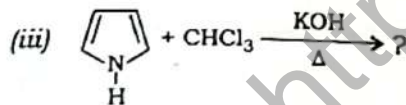
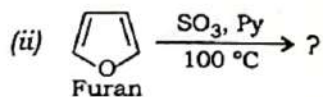
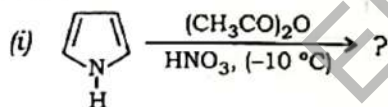
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2. Answer any one question : 6
- (a) (i) Distinguish among 1°-, 2°- and 3°- amines by nitrous acid test. 3
- (ii) How can you synthesize 1°-amine by Gabriel phthalimide method? Give mechanism. 3
- (b) (i) Predict the product and write the mechanism of the following reaction : 1+2=3
- $$R-\text{CONH}_2 + \text{Br}_2 \xrightarrow{\text{KOH(aq)}} ?$$
- (ii) Explain why amines are more basic than amides. 1
- (iii) How will you convert aniline into *o*-bromoaniline? Write reactions only. 2

UNIT—II

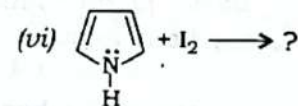
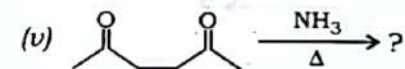
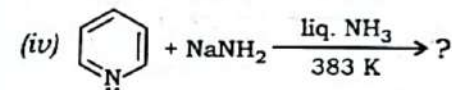
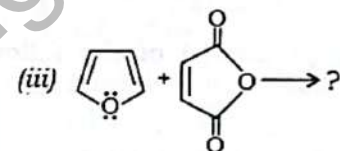
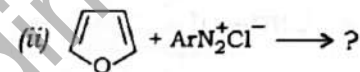
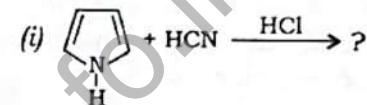
3. Write the products with mechanisms (any two) : (1+1)×2=4



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4. Answer any one question : 6
- (a) Write the product(s) of the following reactions : 1×6=6



- (b) Explain the following with suitable reasons : 2×3=6
- (i) Furan, thiophene and pyrrole undergo electrophilic substitution reaction preferentially at C-2 position.

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(4)

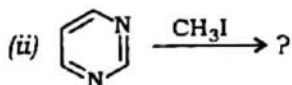
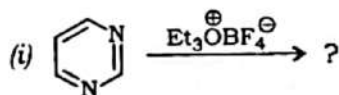
(ii) Pyrrole is more reactive than pyridine towards electrophilic substitution reactions.

(iii) Furan is more reactive than benzene in electrophilic substitution reaction.

UNIT—III

5. Answer any two questions : 2×2=4

(a) Predict the product(s) of the following reactions : 1×2=2



(b) Which is more basic (i) quinoline or (ii) pyridine? Justify your answer.

(c) Prove that quinoline contains a benzene ring.

6. Answer any one question : 6

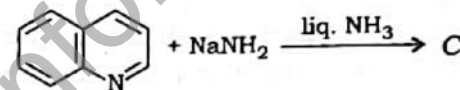
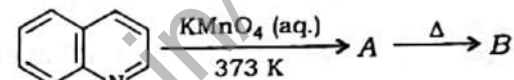
(a) (i) Write the mechanism of Fischer indole synthesis. 3

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(5)

(ii) Identify A, B and C from the following reactions : 1×3=3



(b) (i) Write the mechanism of Skraup synthesis of quinoline. 3

(ii) Explain with suitable reasons, why quinoline gives electrophilic substitution preferentially in the benzene ring at C-5 and C-8 positions. 3

UNIT—IV

7. Write short notes on (any two) : 2×2=4

- (a) Physiological action of alkaloids
- (b) Hoffmann's exhaustive methylation
- (c) Emde's modification

8. Answer any one question : 6

(a) (i) Write a short note on Hoffmann's exhaustive methylation. 3

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(Turn Over)

(6)

- (ii) How can you convert catechol into piperine? Give only reactions. 3
- (b) (i) Give one method of synthesis of nicotine. 3
- (ii) Write the medicinal importances of morphine, quinine and reserpine. 1+1+1=3

UNIT—V

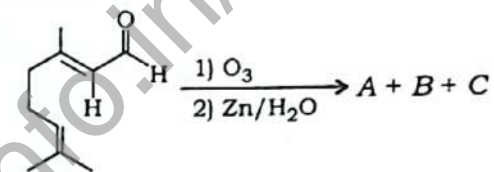
9. Answer any two questions : 2×2=4
- (a) What are isoprene rule and special isoprene rule? Explain with examples.
- (b) What are terpenes? Give one example.
- (c) What happens when citral is subjected to ozonolysis? Give reaction only.
10. Answer any one question : 6
- (a) (i) How many isoprene unit(s) present in sesquiterpenes? 1
- (ii) How would you show that citral molecule contains two double bonds? (Give reactions only) 2

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(7)

- (iii) Identify A, B and C from the following reaction (structures and names) : 1×3=3



- (b) Convert the following (write chemical reactions only) : 2×3=6
- (i) Citral into geraniol
- (ii) Geraniol into α -terpineol
- (iii) Nerol into α -terpineol

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